American Forests and Forest Life

November, 1929

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ADEQUATE FOREST FIRE PROTECTION by federal, state, and other agencies, individually and in cooperation; the REFORESTATION OF DENUDED LANDS, chiefly valuable for timber production or the protection of stream-flow; more extensive PLANTING OF TREES by individuals, companies, municipalities, states, and the federal government; the ELIMINATION OF WASTE in the manufacture and consumption of lumber and forest products; the advancement of SOUND REMEDIAL FOREST LEGISLATION.

The ESTABLISHMENT OF NATIONAL AND STATE FORESTS where local and national interests show them to be desirable; the CONSERVATIVE MANAGEMENT OF PUBLIC AND PRIVATE FORESTS so that they may best serve the permanent needs of our citizens; the development of COMMUNITY FORESTS.

FOREST RECREATION as a growing need in the social development of the nation; the PROTECTION OF FISH AND GAME and other forms of wild life, under sound game laws; the ESTABLISHMENT OF FEDERAL AND STATE GAME PRESERVES and public shooting grounds; STATE AND NATIONAL PARKS and monuments where needed, to protect and perpetuate forest areas and objects of outstanding value; the conservation of America's WILD FLORA and FAUNA.

The EDUCATION OF THE PUBLIC, especially school children, in respect to our forests and our forest needs; a more aggressive policy of RESEARCH AND EDUCATIONAL EXTENSION in the science of forest production, management, and utilization, by the nation, individual states, and agricultural colleges; reforms in present methods of FOREST TAXATION, to the end that timber may be fairly taxed and the growing of timber crops increased.

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AMERICAN FORESTS AND FOREST LIFE

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CONTENTS

THE COVER
"Flying Against the Wind"—Etching by HANS KLEIBER

NINETY-NINE RED DAYS—A Fire Symposium
The Grim Spectacle of the Pacific Northwest—By JOHN D. GUTHRIE 675
California's War Against Fire—By WALLACE HUTCHINSON 677
The Fire Calamity of the Northern Rockies—By HOWARD R. FLINT 680

REELFOOT LAKE
By MARSHALL MORGAN 681

FLYING LOW
Poem by EUGENE ERWIN 682

BABY EVERGREENS
Poem by ALFARETTA LANSING 684

LOST! A FOREST RANGER
By W. H. BOLLES 685

DEATH HURDLES OF THE SKY
By WILLIAM T. COX 687

A UNIVERSITY OF THE WILDERNESS
By ERNEST C. OBERHOLTZER 689

SUMMERING WITH THE ELK
By OLAUS J. MURIE 694

BITTERSWEET
By P. L. RICKER 697

FOREST PEOPLE:
John Fensel's Woodlot—By R. F. WILCOX 698

INLAND
Poem by RUTH FARGO 700

FORESTRY IN LOS ANGELES SCHOOLS
By VIRGINIA JUNE 701

KNOWING AND TREATING TREE DISEASES
By G. H. COLLINGWOOD 705

EDITORIALS 709

A NEW ENGLAND FOREST POLICY
By ROBERT P. BASS 711

INDIAN SUMMER
Poem by MARIE W. MCCONNELL 713

SAPLING SAM'S SCRAPBOOK 714

NEW YORK'S GREAT PLANTING PROJECT
By HERBERT F. PRESCOTT 715

DEPARTMENT OF SCIENCE EDUCATION
Conducted by ELLIS C. PERSING 716

AROUND THE STATES 718

THE FOREST POST-BAG 726

ASK THE FORESTER 728

BOOK NEWS AND REVIEWS 730

"WHO'S WHO" AMONG OUR AUTHORS 736

AMERICAN FORESTS AND FOREST LIFE invites contributions in the form of popular articles, stories and photographs dealing with trees, forests, reforestation, lumbering, wild life, hunting and fishing, exploration, or any of the many activities which forests and trees typify. Its pages are open to a free discussion of forest questions which in the judgment of the editor will be of value in promoting public knowledge of our forests and their use. Signed articles published in the magazine do not necessarily reflect the views of the Association. Manuscripts must be accompanied by return postage. Editorial and Publication Office, The Lenox Building, 1523 L Street, Washington, D. C.

Photograph by Asahel Curtis

".....HIGH, FAR-SEEING PLACES, THAT LOOK ON PLAINS HALF SUNLIT AND HALF STORM."— *Ficke.*

Mount Rainier has been called "one of the noblest mountains in the wide world, because of its compelling personality and imperial bearing, its rich, isolated beauty and the magnificence of the flounced and fluted ermine mantle which it wears with an air of majesty unexcelled."

Crew after crew were forced to fall back and run for their lives

Ninety-Nine Red Days

Since July 1, more than 858,000 acres have been burned over in the National Forests, 724,000 of which were in the West. Although complete reports are not available, indications are that the area burned over on private and state lands will exceed that on the National Forests. To give the public some idea of this grim spectacle, three veteran Forest Service officers, Major John D. Guthrie, Wallace Hutchinson and Howard R. Flint, have pictured briefly just what has taken place this summer in the fire-torn western states.—*Editor.*

The Grim Spectacle of the Pacific Northwest

By John D. Guthrie

ONE thousand, three hundred and fifty-six forest fires, and 300,000 acres burned over, untold millions of feet of timber destroyed, an expenditure of $900,000 in fire suppression, and the sacrifice of six human lives are the brief statistical facts of the 1929 forest fire season up to late in September for the National Forests of Oregon and Washington. Back of these figures are stories of abnormally low humidity, terrific winds, days and nights of anxiety, unexcelled bravery, and the loss of homes and property.

Although the fire season began early in the summer and the first days of July found a number of severe blazes on the National Forests, it was on August 2 that the Pacific Northwest became a raging inferno. On this day a severe dry lightning storm swept from the mid-Cascades of Oregon northward through Washington, leaving hundreds of fires in its wake. Atmospheric humidity dropped, with high winds following, and the fires spread to such size and intensity, especially in Washington, that they raced rough-shod over the efforts of hundreds of men to stop them. The Rainier, Wenatchee, Chelan and Colville National Forests, all in Washington, bore the crux of the assault. On the Wenatchee seventy-three fires were reported, while fifty-three sprang up on both the Chelan and Colville Forests.

KILLED IN ACTION
Douglas C. Ingram, veteran Forest Service officer, who made the supreme sacrifice

Never in the history of the National Forests did fires spread so rapidly. Never did they burn so hard. By August 10 the situation was critical; and then came the fatal day of August 11, said by forest officers to be one of the most destructive fire days on record. Fire lines carefully and laboriously constructed during the slightly higher night humidity were swept over by the flames as if they had never been there, and crew after crew

were forced to fall back or run for their lives. Many fire camps were burned out. So fierce was the blaze that large standing trees and many fallen logs were reduced to ashes. The charred remains of deer, bear, cougar and other creatures of the wild were strewn over the burned-over areas. Portland, Seattle, Tacoma and Spokane were thoroughly combed for fire-fighters, and although they poured into the fire camp by the hundreds, it was necessary to send emergency calls to Idaho and Montana. Every forest officer in the Northwest was rushed to the scene, including two flying squadrons from eastern Oregon.

The Rainier National Forest had more than 300 picked men on its largest fire; there were 500 on the three fiercest fires in the Wenatchee; and more than 700 battled three Chelan fires. Fire pumps, hose, shovels, saws, fire torches, bed rolls and food supplies were being constantly rushed to the lines. Every available airplane in the district was utilized for transportation. Meanwhile, the Olympic National Forest was putting on a great show. On Mount Constance, far back in the high Olympics, a large fire crew would have faced starvation had not airplanes dropped thousands of pounds of food supplies.

As hot and dry days passed the Chelan and Colville fires made terrifying advances. Scouts for fire-fighters crossed into Canada and brought in 150 Doukhabors from a Russian religious colony by special permission from the United States Immigration Service. A snag fell on one of these Russians and killed him; a huge boulder rolled down a slope on a fire-fighter on the Rainier front and he died soon afterwards. A fire foreman dropped dead on a Chelan fire line.

FIGHTING FIRE WITH FIRE

Miles of safety strips resulted from back-firing—but wind-driven flames jumped them as if they had never been there

Then came the disastrous Camas Creek fire on the Chelan front. The fire swung up the steep mountain slopes on the north side of Lake Chelan destroying five miles of flume supplying water to the orchards at Manson. Over the steep crest it raced into large areas of insect-killed pine and into the Methow River drainage. Here high winds made freakish by the topography of the country swept it through tree-crowns in almost any and every direction. Repeatedly fires swept down canyons, around points of ridges, back up parallel canyons, and up over the lodgepole pine ridges, almost trapping, time and again, the desperate fire crews. Men were gassed and fell unconscious in the path of the roaring flames, to be dragged to safety by their comrades. High winds threw smoke-blankets miles ahead of the advancing wall of flame, endangering the lives by suffocation and gas of men resting or asleep in the fire camps. Ted Flynn, a road engineer, rescued a sleeping fire-fighter, gassed by the smoke, just before the fire swept the camp. Flynn was himself gassed, recovering later in a Wenatchee hospital.

It was on this fire that Douglas C. Ingram, assistant in the branch of Range Management in the district office of the Forest Service at Portland, Oregon, after saving a crew by his coolness and bravery, within two days was himself trapped with the college student Ernani St. Luise. Ingram was camp superintendent and his camp had burned. On the afternoon of August 13 he was looking for a new campsite. He asked no one to go with him, but the young University of Washington athlete, St. Luise, volunteered. They started down a ridge trail through a jungle of lodgepole pine, but turned back after finding that the fire was making a flanking movement and might cut them off. But retracing their steps only a short distance they turned off the trail. That was the last seen of them until eleven days later when their bodies were found on a steep hillside more than two miles from where they were last seen. They had been gassed before the flames reached them.

August 27 brought another blow-up and men and organizations were pushed to the breaking point. Brush-burning fires of settlers and ranchers began to break away with the east winds. The air became saturated with acrid smoke; cinders began to fall in towns and cities. Then Oregon fires began to send up great black columns of smoke. Berry pickers started a bad fire on the Mount Hood National Forest. It was stopped by 160 men who kept pumps constantly going. The Whitman, Wallowa and Crater Forests kept the Oregon forest officers in despair. Ten cottages were burned in the Crater fire. A falling snag killed a fire-fighter on the Mount Hood front.

Smoke spread over the entire Northwest in a perfect screen so that it was impossible for lookouts to report new fires. Thousands of brush fires on state and private lands began to spread together. Logging camps, bridges, ranch houses, summer homes and fences were burning. Then came the drastic order on September 11 that closed the National Forests of Oregon and Washington to the public. At the same time the governors of the two states issued proclamations asking all lumbering to cease. Oregon deferred the opening of the hunting season. By September 12 the smoke was so dense that the sun could hardly be seen. Air patrol became ineffective and dangerous.

Under the dense blanket of smoke entered the sneaking incendiary, and men, tools and food supplies were rushed to

another front in southern Oregon. The Umpqua National Forest, victimized by the incendiary menace, had 375 men on a 6,000-acre fire. Hundreds were fighting man-set fires on the Siskiyou and Siuslaw Forests. Oregon became a blazing torch, and rangers and the flying squadrons were rushed back from Washington where rains had brought the larger fires under control. But no sooner had the men reached the Oregon front when things began to boil over on the Olympic, in Washington, from a smoker's cigarette. Then the Dole fire, just outside of the Columbia National Forest, broke away and swept 20,000 acres, burning homes, ranches and schools. Here an old settler was burned to death in his cabin. Troops were called from the Vancouver Barracks.

By September 26 rain had fallen west of the Cascades, and all Washington fires were under control. In Oregon, a general rain aided in bringing all fires north of Coos Bay under control. But the fire danger still remains—the fire season of 1929 is not yet over in Oregon and Washington.

THE FIRE TANKS GO INTO ACTION

Wherever roads led into the fire areas, the fire tanks cut down the enemy with their deadly stream of water

California's War Against Fire

By WALLACE HUTCHINSON

THERE has been a great war fought in California this summer—another gruelling campaign in a war that has swept the state for over twenty-five years. It is the war of federal, state and county foresters and rangers against fire.

It has been a very real war—a grim war. The leaping, crackling flames that swept the valley fields and mountain slopes have shown no mercy to forests, houses, wild life, or mankind. The path of their destruction is marked by thousands of acres of ghostly tree trunks, lone chimneys standing amid smouldering ruins, and charred carcasses of little fawns. Here and there is a broken family circle.

Treason, too, has marked the advance of this vicious enemy. The incendiary with his smoking torch, aided and abetted by those who openly preach the pernicious practice of repeatedly burning fields and forests to improve the grazing and protect the mature timber, has laid a trail of arson fires throughout the length and breadth of the land, and turned the fire hunt into a man hunt.

Compared with the Pacific Northwest and the Inland Empire, the 1929 fire season in California may be classed as "favorable." Although the total number of forest, brush, grass and grain fires that occurred in the state up to late September this year was less than for the season of 1928, the total damage done by these fires will equal, and probably exceed, that of any season in the past ten years, due to improvements, personal property and valuable watershed areas burned in the Mill Valley and Sisar fires. Although the first general fall rains have yet to reach California, it is not believed that late-season fires will add materially to the present record.

The conditions leading up to the 1929 fire season were as follows: The winter of 1928-29 in California was very deficient in snow and rainfall. This deficiency, added to the accumulated deficiency of preceding years and coupled with the lack of adequate early spring rains, gave promise of a long-drawn-out and extremely bad fire season. In June, however, two storms swept over a large portion of the state and materially changed the fire outlook, especially in the mountain regions, where heavy rains fell. The beneficial effects of these storms in the hot foothill and valley lands was of short duration, and the rain there actually increased the fire hazard by "bleaching-out" the grass in fields and ranges and making

it more inflammable than before the storms. As the season progressed into mid-summer, fire conditions again became acute, but frequent periods of high humidity and a lack of dry electrical storms greatly aided the federal and state protective forces in the prevention and suppression of fires.

During the latter part of June, California suffered severely from the hot wave that swept the West. As an aftermath of these weather conditions the fire season "opened with a bang" about the first of July. At one time during this critical period over twenty-five large fires, ranging in size from 1,000 to 40,000 acres, were burning in widely scattered parts of the state, from Mt. Shasta on the north to the San Jacinto Mountains in southern California. The area burned over during this period is estimated at 325,000 acres, mostly grass and brush, and the resultant damage at more than $1,500,000.

The Mill Valley fire of July 2 was the most serious conflagration of this outburst, and the most disastrous to improvements of any fire that has occurred in California since the Berkeley holocaust of 1923. This fire started on the brush and oak covered slopes of Mt. Tamalpais, in Marin County, and after burning a few hundred acres was swept by a dry north gale into the town of Mill Valley, where it destroyed 125 houses and cottages and left many people homeless. The total damage to property caused by this fire, which was due to human carelessness, amounted to $1,250,000. It was fought by state, federal, county and municipal forces, and soldiers were called out to protect the stricken area.

During this same hot-weather period four of the largest brush and range fires of the year broke out on lands protected by the state rangers. These were the Blossom Ranch fire in Tehama County, which started June 25 and burned 20,000 acres; the Vineyard Canyon fire, in Monterey County, which started June 28 and burned 40,000 acres and caused damage amounting to $32,000; the Greasewood fire in Tehama County, which started June 29 and burned 27,500 acres; and the Hensley fire in Madera County, which started July 1 and burned 40,197 acres, with damage amounting to $53,000.

Forest Fires and War

WHAT better comparison than to liken forest fire fighting to a war? On the one side, the enemy that never sleeps, with its cruel, searing tongues of flame and acrid, blinding smoke. On the other, hundreds of men equipped with the weapons of fire conflict—the shovel, the ax, and the mattox—led by a few trained officers. A pitifully small army of defenders facing overwhelming odds.

As in actual warfare, the position and fighting strength of the enemy must first be determined. Then a council of war is held and the best methods of carrying on the fire campaign worked out. Airplanes are sent to scout the field of battle. Fire fighters are rushed in automobiles to the nearest fire front. Great lorries loaded with tools and supplies thunder their way to the scene of conflict. Camps are established. Red Cross tents are pitched. Food and bedding are provided for the fire soldiers. Emergency telephone lines are strung to the outside world. Trucks equipped with meteorological instruments are stationed near the fire to forecast weather conditions.

Every move of the enemy is matched with a counter offensive. Shock troops are thrown against the smoking flanks of the foe. Trenches are dug to mineral soil to stop the creeping flames. Fire-breaks are cut through the brush and timber to check the advance of the enemy. Back-fires are set to fight the oncoming fire with fire.

Brave men and true are the fire fighters who face the charge of this relentless foe—men who know well the tricky, merciless enemy that seizes upon every advantage of wind and weather, that raises no white flag of truce, that is never beaten until the last red spark is dead. Bleary-eyed men, digging, sweating, cursing under a blood-red sun; exhausted men with smoke-filled lungs, parched throats, and weary muscles, who stagger when they walk, gulp their coffee, bacon and beans, and instantly fall asleep when they sprawl out on the hard ground.

There are heroes, too, in this army. Unsung heroes, wearing the badge of a forest ranger; heroes who unflinchingly give their lives when duty calls to protect the nation's heritage, or to save their fellow men.

Fight! Fight! From dawn to dusk and from dusk to dawn—a day, a week, a month. Here a mile of fire line lost; there two miles of ground gained. On and on until finally the red demon is conquered and the battle won.

And you and I, what part have we in this grim war? We cannot, even if we wish to do so, shirk the responsibility which the tragedy of forest fire places upon us as citizens. For a fire that devastates the fields and forests of our land affects its every home. Because of such a fire the lumberman will sell less timber and pay less taxes. The farmer will sell less crops. The merchant will sell less goods. Less material will have to be produced in other sections to supply these laborers. Less machinery will have to be built. And so the effects of this one fire are carried to every American home.

Are you for the arch enemy Fire, or against him? Your words and deeds are the answer. For, after all, it is my business, your business, and good business to prevent forest fires.

—Wallace Hutchinson.

The remainder of the month of July was marked by two large fires on National Forest land. The Santa Ana Canyon fire in the San Bernardino National Forest, starting July 15, burned over 4,000 acres of rough, brush-covered mountain slopes. More than 600 men were called upon to suppress it. The Sugar Hill fire in the Modoc National Forest started July 22 along the right-of-way of the Southern Pacific Railroad outside the forest, and swept before a gale through 4,000 acres of fine timber and burned a large part of an operating lumber camp and sawmill set. The loss in timber values from this fire is estimated at $150,000, and of improvements $50,000.

August and September will long be remembered for their outbursts of incendiarism. The first incendiary fires of the year occurred in the Klamath National Forest on July 14, when a "firebug" set a string of seven fires. This pernicious practice gradually spread through the northern part of the state and reached its peak in mid-August with arson fires burning in fifteen or more counties. After this outbreak there came a lull, but on September 15, during a period of low humidity, high temperatures, and heavy winds, when fire-lookout stations were out of commission due to poor visibility caused by heavy drift smoke from the Oregon fires,

which spread a blanket over all northern California, the sneaking incendiary again took up his nefarious work with renewed vigor.

During the high fire hazard of mid-September, more than a score of incendiary fires in the redwood region and Coast Range to the north of San Francisco burned over approximately 40,000 acres of brush and scattered timber, threatened a number of towns and resorts, and seriously taxed the fire-fighting organization of the State Division of Forestry. During this same period, twenty-five other forest and brush fires, many of which were set by incendiaries, swept over more than 90,000 acres of federal and private lands in other parts of the state. The largest of these conflagrations, not incendiary however, occurred in southern California, where a very serious fire situation was happily turned into a favorable one by light but timely rains.

THE RED ENEMY ADVANCES

The leaping, crackling flames swept forest and field, menacing life and property

The most serious conflagration of this period was the Sisar fire in Ventura County, which is reported to have started from a broken high-tension electric line. This fire burned more than 15,000 acres of brush-covered land extremely important as a watershed protective cover, destroyed a large number of oil derricks and several houses and school buildings and seriously damaged a number of large orange and lemon groves, and ranches. The loss in oil-well improvements and orchards alone is estimated at over $325,000, with damage to watersheds running into high figures. The fire was fought by county and government rangers assisted by men from the oil fields, citrus associations, water and power companies, and local ranches and business houses. Summing up, the 1929 record of forest, brush, grass and grain fires in California, up to September 20, is as follows: Total number of fires, 2,976; man-caused fires, 2,713; total area burned, 634,596 acres. Of the man-caused fires, 1,065 were caused by smokers, and 364 by incendiaries; a total of 1,429 fires, or fifty-two per cent of the man-made conflagrations.

Four men were killed on fires in California during the season. One man was struck by a falling rock; two were burned to death, and a Forest Service guard was fatally injured when he ran head-on into a truck obscured by smoke, while scouting the Sisar fire on a motorcycle.

One of the encouraging features of the 1929 fire season has been the renewed awakening of an active "fire-consciousness" in the people of California, and a keener realization of personal responsibility in the protection of the State's natural resources. Effective cooperation with federal, state and county foresters was rendered by many civic, commercial and business associations and clubs, among which may be mentioned: The State Chamber of Commerce and its affiliated chambers; State Division of Fish and Game; State Division of Highways; Los Angeles County Conservation Association; Pacific Telephone and Telegraph Company; Association of Foresters and Fire Wardens of Southern California; California Forest Protective Association; Automobile Club of Southern California; California State Automobile Association; Richfield Oil Company, and the Stop-Forest Fires Committee of California.

OVER THE TOP!

Shock troops of the forest penetrating into the red enemy's territory

The Fire Calamity of the Northern Rockies

By Howard R. Flint

IN THE Northern Rocky Mountain regions of Montana and Idaho the forest fire season of 1929 developed with little in its early history to suggest impending calamity. A few observers of long experience noted a deficit in precipitation which began in July, 1928, and continued in an unobtrusive way through the autumn of that year; through a fairly severe winter; through a cold, backward spring, which lulled all but the most pessimistic into a false sense of security in regard to the supply of surface moisture in the mountains; through a June with slightly above normal rainfall, which contributed further to common belief that the season was an ordinary one.

During ninety-nine days following June 15 the total rainfall recorded by the United States Weather Bureau station at Spokane, Washington, was about one tenth of an inch, a negligible quantity. With so slight a rainfall, following months of subnormal precipitation, burning conditions in the resinous forests of the mountains soon became acute. About July 20 the thinly spread, skeleton protective force which is customarily provided for the region was out-pointed by numbers and rate of spread of the fires and never again, until the arrival, after September 20, of belated fall rains was it able adequately to cope with the situation.

During the season the National Forest forces alone handled 1,800 fires in Montana and Idaho, 1,600 of them confined to areas of ten acres each or less. The others, spread over 200,000 acres, cost for suppression alone at least two men's lives and more than a million dollars in money. Damage, when appraisal is complete, will amount to at least another million; this for the National Forests alone. Statistics for the widely scattered, privately owned lands—some of them wholly unprotected, others protected by nine different protective associations—and for the State, Indian, Public Domain and National Park lands are not yet available, but the losses are known to have been large, no doubt larger in proportion to acreage involved than those on the National Forests.

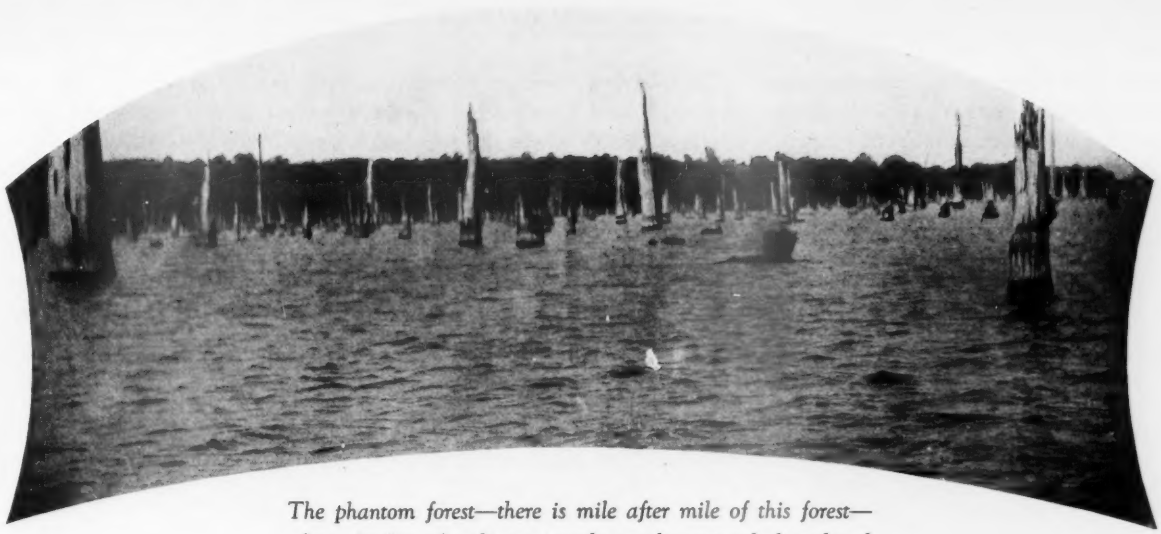
THE DEATH!

Seared and scorched and bleeding, the wounded pine is felled to check the spread of the flames

In twenty years of history carefully compiled and recorded for the Northern Rocky Mountain region by the Forest Service the losses in timber, in young forest growth, in watershed protection, in scenic beauty, and in human lives has been appalling to the few who know the figures. More than ninety per cent of all the losses have occurred in but four of the twenty years.

The situation can never be controlled and the National Forests protected as long as we must proceed at snail's pace to construct trails, telephone lines, buildings, roads, and other improvements necessary for reasonable travel and communication and housing of men and equipment. It can never be controlled so long as we must proceed on the stupid basis of a protection force adequate for an "average" season. That is as sensible as it would be for a city to compute its average number of fires per day and provide a fire department adequate to handle that number as a maximum in any one day, and say that when more than that number occur it would hire a temporary force to supplement the regulars.

Can the wealthiest 120 million people in the world afford to spare eighty-four of its men as a sacrifice to the Beltane god; use $30,000,000 worth of wood on midsummer bonfires; spend $4,000,000 in the laborious digging of more or less futile ditches around the smoking ashes of the vast spectacles; suffer fire-sacked avenues leading into their finest National Parks; and maintain millions of acres of potential timber land idle and unproductive? What good sense can there be in a policy that requires another twenty years at present rate of progress to construct improvements designed and needed for protection of National Forests from fire and in the meantime perhaps for want of them lose another twenty or thirty millions of values in forest growth? Is this what the American public wants or is it what it gets for the sole reason that it does not know what is happening back in the mountain fastness? Whenever a fully informed public tires of this preposterous performance the curtain can perhaps be rung down on it by reshaping the Nation's forest fire control organization adequately to meet the extreme rather than the "average" season. And certainly that kind of fire-control organization would not be altogether illogical or unbusinesslike.



The phantom forest—there is mile after mile of this forest—about the foot of each stump and snag the waters lash and curl.

Reelfoot Lake

The Great Hunting and Fishing Preserve an Earthquake Made

By MARSHALL MORGAN

EARTHQUAKES have been classed among the most destructive agencies in all the catalogue of disasters. Destroyers of cities, towns and people, they have exacted a toll of more than half a million souls during the last two hundred years. Sicily, Lisbon, Caracas, Yokohoma, Tokyo, San Francisco, Valparaiso—each of these names recalls a terrible catastrophe that leveled houses, killing men, women and children.

Few can see the creative aspect of these subterranean fires and concussions, or understand that any good could come out

Banked thick and wide all up and down the bewildering stretch of desolate looking waters is the saw-grass, with its knife-like teeth.

of an earthquake. Yet the geologist can envision it as a master sculptor that with a few decisive strokes alters beyond recognition a section of the earth's great face. It has created mountains, islands and valleys; shifted rivers from their course; carved great divides and canyons of breath-taking beauty; mysteriously reared up islands.

Little more than a century ago, on December 16, 1811, a great earthquake convulsed the valley of the mighty Mississippi, followed by successive upheavals which terrified the Indians, causing them to believe some awful visitation of the Great Spirit was upon them. The white settlers, too, on the opposite shore, fled their cabins in terror. Frightened horses ran snorting into the fields; dogs barked; the ground rose and fell like ocean waves; trees tilted until their branches interlocked and snapped. There were great landslides down the bluffs. The river seemed to be lifted suddenly from its bed by a giant's hand and dashed far and wide across the land. Its waters, returning in mad torrents, mowed down whole forests and hurled them into the mad vortex of water. Banks caved in. Islands disappeared. New land was formed. And over in "the Indian country," in what is now Tennessee and Kentucky, a great lake was born.

That lake, the Reelfoot of today, has since become one of the most noted hunting and fishing grounds in the United States, administered since 1921 as a state game and fish preserve by Tennessee. Its fantastic beauties have delighted tourists and its splendid fishing and duck shooting have thrilled and quickened the heart of many a sportsman.

The Reelfoot country had always been famed for good hunting. Before the earthquake had molded the basin and impounded the waters of the lake, buffalo, deer and black bear had roamed the dense forest in the Mississippi bottoms. The scream of the panther often had profaned the wilderness and the wild turkey, then as today, slipped stealthily through the thickets. This was the Indian's hunting ground before the white man came. Here rose the smoke of his campfires; here were his villages and pointed tepees. It was in this region, on the site of the Chickasaw village of Chisca, named for their great chief, that Fernando De Soto crossed the Mississippi in April 1541 or 2. Not far from here he died, heartbroken over his failure to find gold, and was lowered at midnight into the muddy waters of the river he had discovered, stealthily lest the Indians learn the tattered little band had lost its leader.

This land was comprised in the grant of Queen Elizabeth to Sir Walter Raleigh, in March, 1584. A century later the standards of Louis XIV were planted at the mouth of the Mississippi and the lands were claimed by La Salle in the name of the king of France. Now settlers began to come down the river and establish themselves, so that, at the time of the earthquake, quite a colony existed on the western side of the river at New Madrid. Among the first of these pioneers was Davy Crockett, hero of the Alamo. Eliza Bryan, an eye-witness of the New Madrid cataclysm, described the earthquake lake as communicating with the Mississippi at both ends and thought that in a few years the principal stream, perhaps the whole river, would pass that way. Instead the waters gathered themselves together to form a garden of weird fantasies, a sanctuary for myriad forms of bird and animal life. Thirty-five miles long, three to ten miles wide, with countless arms and channels, this gift of the earthquake stretches parallel to the Father of Waters.

Stalwart giants of a forest primeval line its shores—poplars, oaks, ash and walnut, cypress and beeches—that tower majestically above the reeds and lily pads. Bending willows frame the water's edge and waving rushes are banked thick and wide up and down the bewildering stretch of desolate-looking water. Beyond the rushes are fields of lily pads, or jonquapins, that flourish in the summer sun, then sink in autumn to rest a while on the surface before settling to the bottom of the lake. From the dark shadows, beyond the lilies, loom ghosts of a once mighty forest, great frowning, blackened, ragged trunks of mutilated trees that stretch gloomily mile upon mile. Each trunk measures its distance and more in somber silhouette upon the lake. The waters lash and curl about them in white-capped waves, as if to destroy even these fragments that still defy them of the once proud and splendid forest. Through a century of storms this silent, leafless battalion has withstood the pounding waves and the shock of the winds that sweep the lake, standing like grim sentinels over the possessions hidden beneath them.

The water of the lake is clear, revealing a moss-covered bottom of varying depth, full of snags and roots and cypress knees, the hiding place of millions of fish. Here where the water is shallowest, the knees protrude a few inches above the surface; over there is a sunken log piled across another, with broken stumps nearby. Crappie and sunfish dart among the lily pads and along the edges of open water big game fish, large-mouthed bass weighing from five to seven pounds, can be seen scurrying for the shallow water under moss-beds and green scum.

High overhead sounds the "Honk! Honk!" of the Canada goose, where led by a giant gander, a flock is winging toward a nearby wheat field. Ducks whiz by, bound for some favor-

Flying Low

—EUGENE ERWIN

Flying low, flying low,
Through the late chill air they go,
Beneath the clouds of gray and white,
Oft-tinged with scarlet evening light.
From deep retreats and marshy waste
They flee, urged on by winter's haste,
And o'er the lake so cold and drear
Their honking sounds the only cheer,
As swift the dark'ning sky they cleave,
And bid the north-most shores their leave,
Southward bound.

Drifting slow, drifting slow,
Like feath'ry flakes of distant snow,
Against the green of yonder pines,
In two outspread convergent lines;
Pale harbingers of cold are they,
Now pausing by that wintry bay;
But fleeing from the breath of night
Across the lake in hurried flight,
They top the ancient, birch-tree blaze,
And vanish through the dusky haze,
Southward bound.

ite feeding ground of mule-foot, jonquapin or smart weed, and up the lake ahead a flock of water turkeys, or cormorants, is led by a few mallard ducks. Water chickens, or coots, rise from the lake in clouds, fly lazily ahead, then settle down again. Wheeling high aloft, in wide graceful circles, a fish eagle sails, the white spots on his wings flashing sunlight. On a dead limb a kingfisher hammers away, trying to kill a skip-jack he has caught. There is a soft plunk as a musk-rat slides into the lake, a scampering sound as a squirrel hurries to his hole in a big beech. It is a small wonder that many camping parties journey to Reelfoot, to fish and hunt and revel in the strange scenery. Before venturing forth, the wise sportsman enlists the services of the Reelfoot "pusher," that ragged, taciturn, mysterious and picturesque fellow who knows the moods of the waters and how to navigate those frail little crafts built for crossing shallows as well as the deep places and which in inexperienced hands might easily capsize. The "pushers" live all up and down the lake and no one knows whence they came. Rough and uncouth in appearance and manners, some give in conversation evidence of good education and former refinement; but it is as bad form to ask them where they came from, and why, as it would have been forty years ago to ask a man his right name in the Texas Panhandle.

The "pusher" sends the light boat over the shallows by means of a long pole with a V-shaped prong at the end. Hence his title. Over the deep water he uses a paddle. He knows what to do in a storm and when the boat runs up on a cypress knee and balances. He saves the sportsman much manual labor and helps to swell the size of the string of fish or bunch of ducks by furnishing valuable pointers. Every locality has its own style of fishing and at Reelfoot it is best to do as the natives do; this is no place for fine tackle and quadruple reels. The bass live down among millions of snags and stumps and logs, where they would be lost easily if a sportsman attempted to play them. The "pusher" uses a long stout cane pole, short line, large hook, little or no sinker, and a fine skip-jack minnow for bait. When the bass strikes,

SUNSET ON REELFOOT

"Pow! Pow!"—the sharp crack of heavy loaded smokeless shells sounds in the stillness. The leader, a big green-head, and the duck behind him, fold their wings and drop with great splashes among the decoys. Immediately in front, the lake seems a veritable sea of gold and silver sparkles, and way down—at the timber line of the open water—blood-red fire glows through the stumps, lend the appearance of a furnace in full blast, the molten metal flashing brightly through the open windows

he hauls it out by main strength and drags it over the side of the boat as quickly as possible. Another method is called "limbin' 'em." Short lines are tied along the edge of the water to swinging limbs and baited. The limbs bend when the fish strike, fly back suddenly, and the bass is hooked!

"Rough" fish—blue and yellow cat, sturgeon, carp, drum and other species—are caught at Reelfoot by the thousands for the market. In garnering these, the natives use the celebrated trammel net, a wide-meshed affair, half a mile long or more with large floats. When fish are located it is set in a circle about the place. It hangs straight down for five or six feet and against it, on the inside, is arranged a fine silk-like gill net. The fishermen, inside the circle, begin to beat the water with their paddles when a signal is given, rattle their oar locks and produce other noises calculated to terrify fish. The victims dart against the gill net, forcing it into the large meshes of the outer net, and thus are pocketed. Perhaps the natives learned this from the water turkeys, for their method is similar. Like soldiers, the turkeys line up and spread over the surface of the lake when they have located a school of fish. The two ends of the line are ahead of the center, flanking the school like the giant nippers of a pair of pliers. As the ends close in the birds beat the water with their wings and the frightened fish soon find themselves surrounded. They skip confusedly over the surface and the water turkeys close in and make a hearty meal.

Duck shooting at Reelfoot begins in November. Weather conditions are watched closely and when the first big storm heads south the "pushers" know that the ducks and geese are riding before it and that first flight time is due. Word goes out by telephone and wire and, from every direction, hunters hurry for the lake country.

The careful hunter plans to arrive on a Saturday or early Sunday morning, when no shooting is allowed, so that he may make his preparations for the morrow. Arrangements are made for lunch, decoys are made ready and a good shooting-place is selected. Guns are assembled, shells placed handy, hipboots, sweaters and hunting coats unpacked. The hunter is off with his "pusher" next morning before the sun is up, gliding in the swift shell-like boat out toward the open water, where the ghostly trunks of the broken trees seem to beckon him ever onward through heavy low-hanging fog. High overhead he hears the honking of geese, then a tantalizing rush of wings as a flock of ducks whiz by in the mist. Finally the dangerous water has been negotiated and the little boat docks in a haven of lily beds and rushes. The decoys are thrown out, the craft headed into the thickest clump of saw-grass, which the "pusher" ties together overhead to complete the concealment. Now he rises and sounds his duck call as he spots a flock of mallards riding fast with the wind, and high overhead. The mallards pass, then wheel and turn as the hoarse sound reaches them, circle, and the hunt is on!

The best shooting is early in the morning but not before 8 a. m., according to strict "Reelfoot" law, and late in the afternoon. Connoisseurs watch for a morning after a night of no moon; for when the moon is full the ducks feed at night and are not hungry next day, but sit around lazily. At noontime sport is dull, giving the hungry hunters time to eat the hearty lunch they have brought and gather up the birds that have been dropped. In the afternoon the sport begins again. When quitting time comes, early enough not to disturb birds coming to roosting grounds, the boat is pointed toward the camp. Slowly darkness closes. The men are in a merry mood and fragments of song and jovial halloos float across the placid surface of the lake.

Suddenly, the west is flushed with color. The glory of the Reelfoot sunset hushes all man-made sounds. Before the boat is spread a sea of gold and silver sparkles, flecking and dancing on the rippling waters. Way down the lake, at the timber line of the open water, blood-red fire glows through the stumps, lending the appearance of a furnace in full blast, with molten metal flashing brightly through open windows. Above the lake surface and the gaunt tree trunks, the red changes to a softer hue, then merges to pink; still higher the pink becomes soft purple, melting away into the bright-starred skies. Along the shore, lights point the way to camp.

BABY EVERGREENS

Oh, little evergreens, that blink and nod
By windows bright, or on the moonlit sod,
That shine with candles—or beneath a star—
Oh, little Christmas trees, you truly are
A happy emblem or a sacrifice,
We soon should fashion some more fair device
For indoor decoration, that your day
Shall round itself in beauty, so you may,
Wear only birds, at dawning, in young joy,
And, for a night, an angel or a toy.

—Alfaretta Lansing.

Lost! A Forest Ranger

By W. H. Bolles

Illustrated by Alfred G. Clayton

There have been a great many stories about lost people and forest rangers have frequently occupied a prominent part---generally in the role of rescuers. But sometimes the ranger himself becomes lost, as you will learn by reading this story, which was awarded second prize in a contest for man-hunt stories conducted by The American Forestry Association. Mr. Bolles is a ranger on the Idaho National Forest, Idaho

FOREST RANGER Graham McConnell had been assigned to the Middle Fork ranger district, one of the most remote and inaccessible areas in central Idaho. It was a portion of the Thunder Mountain country, a vast area of public domain added to the National Forests in 1920. Because of its recent acquisition this region was deficient in the usual improvements necessary for efficient administration and McConnell, assisted by a temporary man, was to spend the winter building a headquarters station.

The new station was to be located at the junction of Marble Creek and the Middle Fork of Salmon River, more than eighty miles from Cascade, which was the nearest postoffice and railroad point. The necessary supplies and tools had been packed in before storms closed the summits to horse travel and McConnell and his assistant prepared to endure six months of isolation, connected with the civilized world only by a frail strand of telephone wire.

One day in December McConnell was notified of a ranger meeting to be held at Boise. This was rather welcome news for it would break the long period of loneliness and permit him to spend the holidays at home. He started alone upon the eighty mile snowshoe trip to Cascade. It was a hazardous undertaking but the ranger knew the country and was fully prepared to meet its perils. Overnight stops would be spent at ranger stations or other established camps along the route and it was unnecessary to carry food or bedding. About noon he turned up the Pistol Creek trail, soon reaching the snow which grew deeper, obliterating the trail until the only indication of its

He struggled on blindly in the face of the storm, falling heavily over some invisible object in the snow

presence was the telephone line which paralleled it for many miles. This was the slender thread which was to guide McConnell through the mountains. By early afternoon he was obliged to use the long pair of snowshoes that were strapped across his back. Two hours later he entered a trapper's cabin tucked under the shelter of some giant spruces a short distance from the trail.

The stars were still visible next morning when he pushed open the cabin door. Leaning against the logs near his snowshoes was a pair of skis. McConnell hesitated a moment, then made the serious mistake of selecting them for the remainder of the journey. Not being expert in the use of skis, progress was slow and noon found him eating lunch ten miles from the summit. The appearance of low clouds worried McConnell, who realized that it would be impossible to follow the telephone line on a dark night. It soon became obvious that he could not reach the Penn Basin ranger station before dark, but he pushed forward desperately, endeavoring to gain the summit with the remaining hours of daylight.

A storm, starting in the late afternoon, enshrouded him by evening with a soft gray wall of snowflakes, fog, and gathering darkness. He left the telephone line to make a short cut. He soon realized the mistake, but did not consider it serious as he was traveling down grade, presumably into the headwaters of Johnson Creek, a stream which ran near the Penn Basin ranger station. To be sure it would be late when he arrived but hours do not mean much to a forest ranger.

He pushed forward with fresh hope, expecting to emerge from the timber into the broad open meadows upon the head of Johnson Creek and from which Penn Basin derived its name. But no meadows appeared; the country became more broken, and after three hours travel he suddenly realized that he was hopelessly lost. He wandered for an hour longer, then stopped by an overhanging bluff that offered partial protection from the elements. Scraping the snow from the leeward side he kindled a small fire and attempted to sleep while the storm abated and the stars came out, innocent of their part in the picture.

Forest Ranger Parker, stationed at Cascade, inquired about McConnell at the supper table and was informed that he had not yet reached Penn Basin. This caused no concern, but when no word had been received by nine o'clock Parker called all the stations along the line in an effort to learn of McConnell's whereabouts. Everyone seemed anxious and concerned but there was no alarm. It was argued that nothing serious could have happened to McConnell, who was an experienced mountain man. More than likely the telephone at Penn Basin was in need of repair and the lost man would report from Warm Lake the next evening.

When the second day passed without word from the missing man grave anxiety was felt for his safety. The leading papers throughout the state carried it as front page news and everywhere it was the current topic of conversation. Supervisor Mains, of the Payette National Forest, left the ranger meeting in Boise to organize and conduct a systematic search for his lost ranger. The countryside was completely aroused; mail carriers and local settlers were scouring the mountains with dog teams. A party was organized on the Middle Fork of Salmon River to work the trail from that end. But in spite of these efforts no trace of the lost ranger could be found.

McConnell awoke at daylight very much refreshed and considerably encouraged to see that the storm had been of short duration. The country seemed totally unfamiliar but with hours of daylight ahead of him that was of small consequence. He first considered back-tracking in an effort to locate the telephone line, but finally decided to continue down the rocky stream which he had been following. This was an unwise choice and came near to being a fatal mistake.

He made good time for several hours, but the timber became more dense and the slopes grew steeper, materially retarding his progress. He tired by early afternoon and frequently fell over obstructions that would have been easily avoided under other circumstances. The first pangs of hunger had passed but he was losing strength each hour. What he needed most was food and a pair of snowshoes to replace the awkward skis. He was obliged to rest several times during the afternoon only to plunge forward rather recklessly with returning strength. No familiar landmarks appeared and this caused a nervous strain fully as exhausting as the physical exertions. But December days are short; the shadows began to lengthen and it became obvious that another night must be spent in this mountain waste without food or shelter.

Darkness, that great impediment to mountain travel, was again at hand so he stopped and kindled a fire beside a large granite boulder. It failed to offer the comforts of the previous night, but he was too exhausted to seek a more hospitable shelter. However, wood was plentiful and aided by a belt ax he gathered a large supply. He slept during the early part of the night. Towards morning it grew intensely cold and he was obliged to replenish the fire to keep from freezing.

When it became light enough to travel safely he buckled on the long skis and pushed forward, keeping a course parallel to the stream and a short distance away from it. Small side streams joined this principal watercourse at irregular intervals until McConnell was following a good sized creek bordered by shoe string flats. The topography became less rugged and the timber more open; yellow pine appeared at intervals, scattered among the firs and spruces. He was approaching a lower elevation. It became warmer and the snow grew heavier until by noon it began to stick. The waxy preparation, intended to prevent this, had been worn from his skis and the snow adhered to them until travel was next to impossible. Weakened by hunger and fatigue to the point of exhaustion he traveled very slowly, but dared not stop for he realized that one more day without food and he would be too weak to travel.

Rounding a point in the late afternoon he saw a gap in the hills ahead and guessed that the watercourse he had been following would there join a larger stream. An hour later he stood before a sign board inscribed "Burnt Log Creek," with an arrow indicating the stream which he had followed. A telephone wire swung overhead and he knew that the Johnson Creek trail was nearby. (*Continuing on page* 704)

Death Hurdles of the Sky

Overhead Wires a Menace to Birds, Claiming An Unknown Toll of Winged Lives Annually

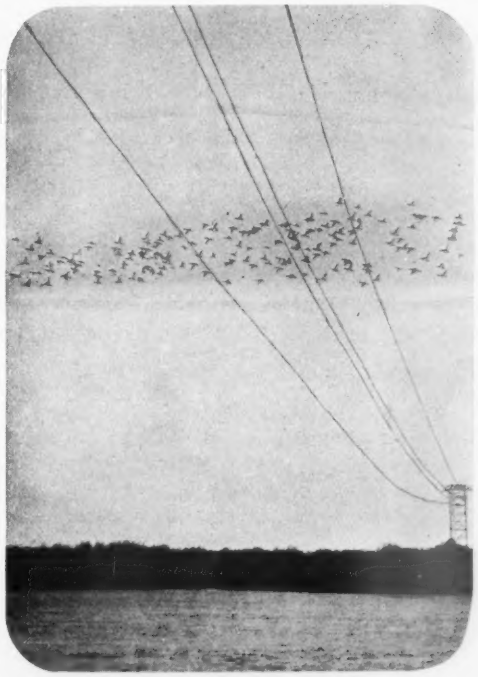
By William T. Cox

IF ALL the airplanes in the country were doing their flying fifty per cent at night and at altitudes from fifteen to two hundred or three hundred feet from the ground, what would the casualty reports be like every morning?

There are millions of miles of overhead wires strung criss-cross over the United States at heights of from fifteen to two hundred feet from the ground. The high wires are mostly where lines reach across canyons or narrow valleys or across rivers from bluff to bluff—at right angles to the very routes taken by wild fowl in their flights.

Prairie chickens, sharp tailed grouse, and partridges, or ruffed grouse flying at dusk or at early twilight, frequently strike wires with fatal results. I have personally witnessed such tragedies. I have picked up numerous species of birds lying dead or injured under telephone, telegraph, and power lines. I have talked with many railway section foremen and telegraph, telephone, and power company linemen who told of much larger numbers of feathered victims they had seen lying dead under the wires.

Not only the larger birds, but a far greater number of song birds at certain times of the year strike the wires and are killed or, what is worse, have their wings broken, only to flutter about until devoured by feathered or furred prowlers of the night. Often in the brush and prairie sections of Minnesota and the Dakotas the early fall snows reveal to the hunter that foxes travel for miles along telegraph lines. Evidently the fox long ago learned what tell-tale tracks in the snow and scattered feathers reveal—that the wire often presents him with a meal out of the air. Why do we see so many cats along the roads at night? May it not mean that the cat, as well as the skunk and raccoon, have learned that the wires which parallel the road leave a chain of free lunches in the form of dead and crippled birds?



At right angles to the routes taken by the wild fowl in their flights, reaching across dark canyons or roaring rivers from bluff to bluff, stretch these Death Hurdles of the Sky

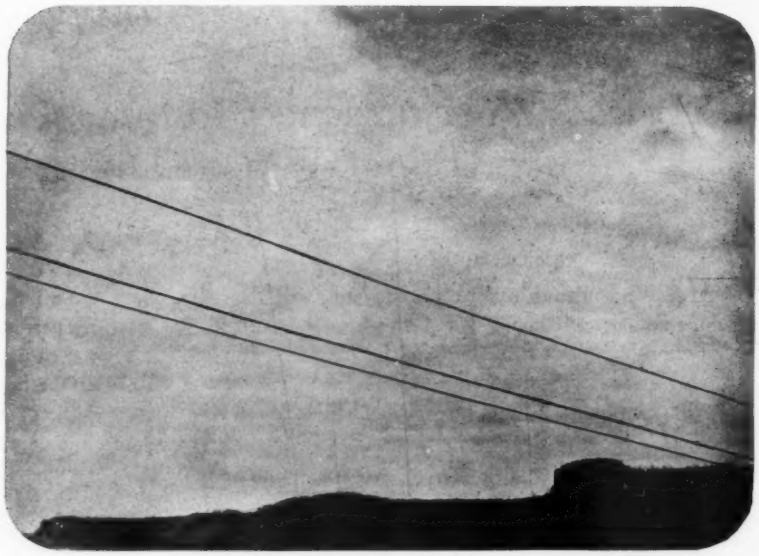
When we consider instances like the following, which have come under my personal observation or are authenticated by persons well known to me, one may well wonder what the casualty list must be. A group of men and boys stood at the boat landing at Wabasha, Minnesota, listening to a flock of Canada geese flying down the Mississippi. The evening was cloudy and dusk was coming on. As the geese, flying low, were almost opposite the men, the sound of a heavy impact was heard distinctly and the telephone wires whirred in vibration along the poles. One of the geese was seen to splash heavily into the river. Immediately one of the boys took a boat and shoved off, guessing as well as he could the location of the drifting bird. In a few minutes he found and retrieved it. The dead goose had a severe bruise at the base of the throat.

Another time in broad daylight a flock of blue-bill ducks was observed coming down from the foot of Lake Pepin. As they reached Wabasha the birds happened to be at just the height of several wires strung across the river at that point. There was a quick succession of thuds and humming sounds and five of the ducks either fell headlong or fluttered to the water. The number of wires, their height and location near the southern end of Lake Pepin make this one of the noticeably dangerous hurdles to be passed by the migrating wild fowl. There are more than 2,000 overhead wires strung across the Mississippi directly in the way of the migrating birds that twice a year take this course between Canada and the Gulf.

At the east end of Lake Winona, the first of Minnesota's 10,000 lakes, there is a causeway leading from the city of Winona to the village of Sugar Loaf. Across this causeway extend telephone wires serving the country to the south and east. During the spring and fall flights of wild fowl, many flocks of the birds cut across to Lake Winona instead of fol-

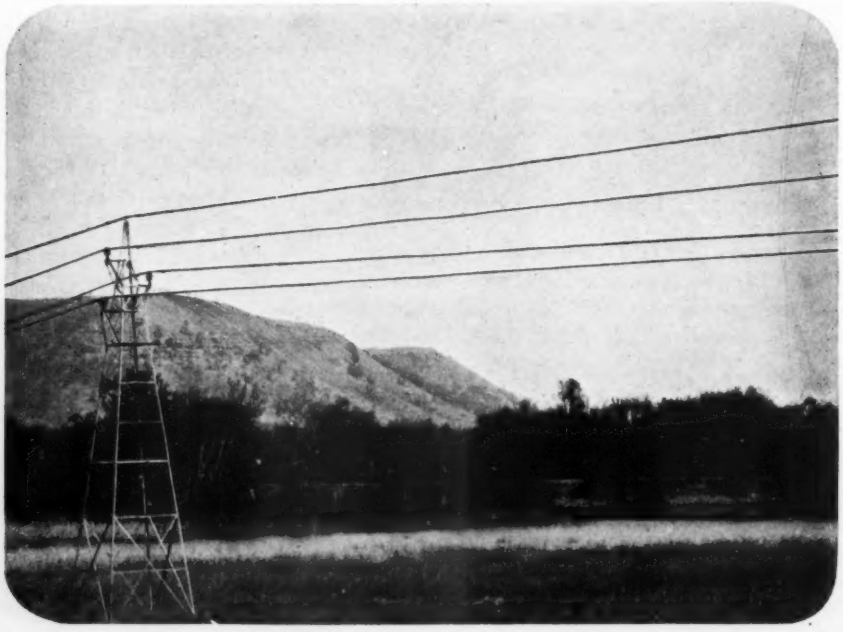
lowing the Mississippi River. The route is more direct. Milkmen and others who travel the Sugar Loaf road across the causeway early in the morning tell me that it is not unusual for them to pick up from one to eight dead or crippled game birds on one of their trips.

Anyone who has "stood on the bridge at midnight" during the bird migration and listened to the subdued chuckling sounds, the chirping and the whirr and whistle of wings, knows that a host of our feathered friends travel at night. Moreover, they travel at a low altitude and follow the glimmer of north and south flowing rivers as guides to the general direction they are going. Think of the toll that must be taken in bird life by the countless thousands of death-dealing wires that span the Missouri, the Wisconsin, the Illinois, and a hundred other avenues of flight.



Power line wires high above the Mississippi near Winona, Minnesota. There are over 2,000 overhead wires strung across the Mississippi directly in the path of the migrating birds that twice a year take this water course in the long flight between Canada and the Gulf

Sudden death and broken wings are dealt by these wires not only to the larger wild fowl but to shore birds and little song birds as well, for these are mostly night flyers. They fly lower than the ducks and geese. Coots, rails, and snipes, as well as larks, plovers and some waterfowl, seem to be common victims. Some years ago woodcock and yellowlegs were often found dead under the wires. Local or non-migratory birds suffer along with the migratory species. I have found many prairie chickens and other upland birds, though never a quail, lying dead under telephone and telegraph lines. The apparent immunity of bobwhite from death by wire is probably due to its habit of flying very low and by daylight only. The wires do not seem to affect the predacious birds greatly, because the hawks fly in the daytime and the owls, while night flyers, are slow in flight and can manage to avoid the wires.



Here are both high power and telegraph lines over an annual duck pass. Sudden death and broken wings are dealt by such wires not only to the larger wild fowl but to shorebirds and little song birds as well, for these are mostly night flyers

Many of the Indians, in days past, devised a simple means of trapping wild ducks by erecting great nets across narrow passages in the known lands of flight of these swift birds. I have seen, on several different occasions, the remains of some of these nets on the Pacific coast and was very much surprised that wild birds as quick and as keen as ducks would fly headlong into such obstacles. Recent scientific investigations have shown, in a number of instances, that nocturnal animals and birds do not see as well in the dark of night as most of us have long supposed they do. It is not to be wondered at, therefore, that in this day of great electrical development and power expansion, the ever-increasing mileage of overhead wires takes, and without a doubt will continue to take, a very heavy toll of our bird life.

The Rainy Lake Country—a thousand lakes in a forest of pine

A University of the Wilderness

The Proposal to Perpetuate by Treaty the Ontario-Minnesota Border Lakes

By Ernest C. Oberholtzer

WHEN Roosevelt proclaimed Superior National Forest in 1909, he established a date in American history. Even he could hardly have foreseen all that was involved. The region that now seems destined to play so large a part in the life of our people was then little known and little used. The sentiment, which Roosevelt typified, was a negligible minority; now it is a popular enthusiasm, waxing brighter each year in public consciousness. He encamped, so to speak, a sentinel of the people in the last mid-continent wilderness and in so doing pointed the way toward proper guardianship of priceless possessions.

Though practical, Roosevelt was moved by other considerations than pocketbook. Future timber requirements of the country, he knew, more than justified the Superior reservation. But that he acted on cold calculation, who that considers his deep sentiment for the pioneer sources of American life can imagine? Superior Forest was also to be made a game preserve by the State of Minnesota and in it was to be protected among other creatures an animal found there at that time in abundance—that largest deer, the moose. Profoundly moved as Roosevelt was by sympathy for the vanishing wilderness and its creatures, who can doubt what made to him the greater appeal? He saw forests, not as the exploiter sees them, as timber alone, but in their larger and multiple benefactions to mankind. And his statesmanlike conception is the foundation of the United States Forest Service.

An outdoor university with a campus of 14,500 square miles, is the way Mr. Oberholtzer describes the Superior-Quetico country of northern Minnesota and southern Ontario, which has been proposed as an International Forest and Park Wilderness, to save it from commercial exploitation. In this article, the third, and concluding article of a series, he tells of the proposal to perpetuate by treaty the great border lakes—the Lakes of Verendrye. This region, says Mr. Oberholtzer, is a museum of original America, containing that part of wisdom impossible to teach indoors.—Editor.

Fortunate for America that in 1909 such men as Roosevelt and Pinchot were in Washington and Carlos Avery and W. T. Cox in St. Paul! Fortunate, too, that there were like-minded Canadians! One of these, Arthur Hawkes of Toronto, then publicity agent for the Canadian National Railway, was the quiet unofficial ambassador, who started the ball rolling. He came to St. Paul in 1908, urging that, if Minnesota and the United States would cooperate in creating a game and forest preserve in northeastern Minnesota, Ontario would match it across the border. Thus came into being both Superior National Forest and Quetico Provincial Park, a proud entail of two and a half million

acres. Without it, in a region less spectacular than Yellowstone but just as rich and rare in blessings and far better adapted to the higher forms of recreation, Americans today would not even have squatters' rights. The two adjacent reserves were a starting point in government control and international cooperation. These are essential requirements, if the opportunity in the Rainy Lake watershed is to be met in a fashion commensurate with the needs of the nation. In face of threats to abandon the whole watershed to private exploitation, the reserves are too limited in extent and authority. Though within their confines they protect the forests and game against certain obvious kinds of attack, they have no provision for recognition of the lakeland, of which they are a part and which is the glory of the forest. Yet they foreshadow in their restricted way the solution that has now become inevitable.

Nature, the original conservationist, knew no political divisions or sign-posts when she created the Rainy Lake watershed and enveloped its thousands of lakes and streams in a forest of pine. It lies in two countries but its unity from every other point of view is striking. All its rock-bound lakes are intimately connected. Those forming the international boundary depend upon tributaries from both sides, all the waters finally converging upon Rainy Lake. Likewise all the lands are similar in their rocky, glacial, non-arable character. The same flowers, fish, birds, mammals and, above all, the same dominant forest, upon which depends every use, are found all over the region. It even celebrates the same history. Whether looked at economically or from the higher social point of view the problem transcends political boundaries and calls for a comprehensive program applied to the whole watershed.

Virgin pine in a virgin country, where man may find the larger half of wisdom—the part that cannot be taught indoors

The immediate emergency is the project now before the International Joint Commission for converting the whole 120 miles of boundary lakes between Rainy and Saganaga into storage basins. It carries with it the logical admission that eventually the whole watershed will become a private pulp and power concession. There is to be a wholesale remaking of the map and untold violence to the age-old scheme of nature. Tens of thousands of miles of wooded shore line and the principal other natural features of the lakeland are ultimately at stake, to say nothing of the effects upon the wild creatures who find refuge in lake and forest. More industry, more employment are promised; it is like pouring water down the throat of a drowning man. This particular industry is limited, not by lack of power, but by its own destruction of timber. As a result of depleted idle lands, the region is becoming daily poorer in resources and saddled with a mounting tax problem. It is not without significance that Koochiching County, Minnesota, where this largest single industry of the state is located, has also the highest tax rate, approaching close to 200 mills. Any acceleration of consumption in this particular industry as conducted now can only hasten the day of complete impoverishment, not only for logging, but for every other use. When the plucking process is done, there will remain only the junk-heap of a liquidated logging outfit.

The one and only sufficient answer to this proposed cataclysm is international action. The project is diametrically opposed to the public policies of the two forest reserves. If those policies are sound and conform to the best public needs, then in the interest of the unique endowment of this region they should be strengthened in order to provide adequate remedy against the ugliness, exhaustion, and uselessness that follow the encroachments of unregulated private enterprise. It is in that direction that friends of the region have been working

ever since the power project reached the light of day in 1925. They have sought to find a permanent international solution that would apply against every threat of waste.

The plan for storage dams has brought the lakes and streams themselves into sharp relief before public attention. It is realized now as never before that the forest problem here, by reason of the lakeland within the forest, is much more than a forest problem. Without its lakes and rivers the forest would have little interest for visitors. They are its sole means of travel and enjoyment, the main-traveled highways through the wilderness. If they are to be sacrificed, the appeal of the region will be gone. On the other hand, if their natural features as viewed from the water can be kept inviolate for the health and enjoyment of future generations, a precious section of original America will endure for all time and the groundwork will be laid on a large scale for the most valuable recreation area on the continent. Nor does it seem necessary, in order to accomplish this great public purpose, to reverse the present policies of the Forest Service by locking up the whole timber resources, on which the region largely depends for a living. Europe has not found it impossible to reconcile a reasonable use of mature timber with the higher social uses. If logging under proper supervision were confined to the unvisited hinterlands out of sight of the traveled waterways and if the whole area were placed on a sustained yield basis, insuring perpetual forest growth and an unbroken forest cover, the main economic objection to a vast reservation on the scale demanded by modern conditions would be removed. The present temporary wood industries would be made permanent. Such an adjustment is possible, it may be noted, largely because popular enjoyment of the area is confined to the lakes and streams and their wooded margins.

So much for analysis. The program grew by careful study of all aspects of the situation and by negotiation with officials and organizations of both countries. It carried the contributions of many minds. In the autumn of 1927 Arthur Hawkes of Toronto renewed his service to the region by a striking news article, in which he pointed out the incalculable advantages to be gained by final official action between the United States and Canada. He suggested a treaty, laying down a uniform policy for the use and perpetuation of all the resources, economic, recreational, scientific, and historical, in the Rainy Lake watershed.

The time was ripe. The international forestry conference had already been called under the auspices of the Minnesota Conservation Council and with the support of the Izaak Walton League of America. It was held at Duluth late in November, 1927. A complete and carefully prepared program was then adopted, with the agreement that a temporary new organization should be set up for the sole purpose of fostering a treaty and of mustering the support of all friends in both countries. The result was the Quetico - Superior Council. What the Council proposes is that with the consent of the Province of Ontario a treaty be adopted between the United States and the Dominion of

Should the watersheds of the Ontario-Minnesota border lakes be converted into storage basins, says Mr. Oberholtzer, the main-traveled highways through the wilderness would be closed forever, and the forests would have little to interest the outdoorsman. There would be no muscle-building portages or cheery camps among the great pines along the hundreds of miles of lake shore

Canada, promulgating the following four principles to apply to the Rainy Lake watershed and adjoining timber lands of like nature:

1. That park-like conditions, free from logging, flooding, draining, and all other forms of exploitation, be established and maintained on all visible shores of lakes, rivers, and islands under public control.

2. That all the hinterlands, not visible from the waterways, be administered under modern forest practices for the continuous production of a maximum timber supply.

3. That all game, fish, fur-bearers and other wild life be managed for maximum natural production.

4. That these ends be pursued under the guidance and direction of an international board, representing forest, park, and biological authorities from both countries.

This lakeland country is the natural home of the moose, greatest of all the deer family

It will be evident at once that the resulting reservation would partake of the nature of both a park and a forest, as the terms are distinguished in the United States. So far as the lakes and streams are concerned, it would establish what would be virtually a vast international park, four times as large as Yellowstone and excluding all economic exploitation. So far as the untraveled interior, back from the waterways, is concerned, it would establish an international forest, protecting water sources, sheltering game, and yielding timber for permanent industry. But it would transcend both park and forest. Its principal function would be to preserve over the greater part of the area a wilderness sanctuary for man and beast.

The wilderness quality of the region is undoubtedly its most precious asset—a monopoly value that is bound to attain huge importance in the future of our people. To maintain this attraction, a vast zoning system is contemplated. The lakes on the outer circumference of the preserve, those in contact with roads and railways and more or less under private ownership, would be left open to the private development of summer homes, camps, hotels, and other facilities consistent with the purposes of the treaty. Certain other nearby lakes, easily reached by trail or water-route, would constitute a narrow inner zone, where leaseholds might be granted, as at present by the United States Forest Service, for the erection of small individual summer camps. The greater part of the area, the innermost zone, would be kept undeveloped and free of all evidences of man. There certain tracts of exceptional timber, even though lying back from the waterways, would remain intact, it is hoped, not only for enjoyment but for the vital purpose of forest research.

The Indians still attend the original school that formed the character of our pioneer race. They are an interesting and picturesque feature of the Superior-Quetico country, and add a wilderness atmosphere of great worth

The program clearly recognizes that the problem is primarily one of forestry but in the broadest and highest sense. Many of its provisions are taken directly from the far-seeing practices of the Forest Service. It involves fire protection and reforestation on a large scale, as well as all the scientific problems with which modern forestry is properly concerned. It makes much of the related functions of the forest, what in any business would be called "by-products"—such as stream protection, wild life propagation, and recreation, which bid fair easily to outrun in time the value of the timber. At the same time it realizes that the problem lies partly in other provinces and accordingly provides for an advisory board including park and biological authorities.

The plan applies to public lands only; but it is expected that Superior National Forest will rapidly consolidate its present holdings and push out its boundaries on the north, east, and west to include all available private lands that are suited solely for forest purposes and are not interspersed with industrial or farm lands. There are many such holdings, largely idle and tax-delinquent. One forest authority has aptly referred to them as a potential "new public domain."

Ontario, with her wiser land laws, has no such problem. Except for small holdings on Rainy Lake and along the line of the Canadian National Railway, which skirts Quetico Park on the north, there are few private lands. Ontario, still sovereign in her own forests, is free to make any disposition of her woods and lakes that she likes. The trend of opinion may be judged by acts passed last spring by the Ontario parliament at the instance of the Minister of Lands and Forests. These acts have for eventual purpose the placing of the entire timber resources of the province on a sustained yield basis.

It is the hope of the sponsors of the project that the Quetico-Superior area will include the northeastern tip of Minnesota from the present eastern border of Superior National Forest to Pigeon Point. This section lies in the Lake Superior watershed but is of similar character and beauty and contains the historic village of Grand Portage. The latter has earned the name of the Plymouth Rock of the Northwest, for it was over this portage that Verendrye and all the early explorers passed and it was here that the fur-trade celebrated its greatest triumphs. Moreover, Grand Portage, though entirely in American territory, is the subject of a special guarantee in a remarkable passage of the Webster-Ashburton treaty of 1842, which says "*that all the water communications and all the usual portages along the line from Lake Superior to the Lake of the Woods, and also Grand Portage, from the shores of Lake Superior to the Pigeon River, as now actually used, shall be free and open to the use of the citizens and subjects of both countries.*" Surely a fitting precedent, if ever there was one, for this present-day re-dedication!

If the hopes of the sponsors are realized, some ten million acres will be set aside in the two countries under the objectives of the treaty. No boundaries can yet be fixed; but there is reason to believe that, when the plan is fully understood, the area will be larger rather than smaller. The principles of the treaty are applicable, without disruption of neighboring industry, to a wide territory, especially in Canada. It is unthinkable that Ontario will fail to appreciate the good judgment of protecting her incomparable wooded shores. Already airplanes are landing on all these lakes, bringing them within a few hours of the crowded cities. Ontario has an immense recreational resource with an unlimited market in the United States. It is more than likely therefore that the lakeland corridor joining the north end of Rainy Lake to the northern part of the Lake of the Woods at Kenora will be included within the Quetico-Superior area or will at least have applied to it the same principles. Likewise, Manitoba has plans for a similar park in the eastern portion of the province adjacent to the Ontario border. If these plans materialize, we may see the greater part of the 400 mile belt of forested lakeland between Port Arthur and Winnipeg administered under much the same policies of conservation.

In Minnesota the possibilities are far more limited. The wilderness and its connected lakes are much more restricted and reckless industry has gone too far. To the west of Superior National Forest, where the counties tried a disastrous experiment of draining lands unfit for agriculture, the State has just had to assume the burden and is now taking over a great tract of unproductive swamp as a game preserve. This tract of 1,500,000 acres, while lacking the charm and resources of the lakeland to the east and north, will doubtless contribute toward the purposes of the international forest by further arresting the onslaught of civilization. More and more the citizens of this entire region are realizing the primary fitness and true economy of devoting strictly forest lands to forest purposes. And the better part of their wisdom lies in the recognition of the higher uses of the forest, wherever the intangible social values are present.

Any such plan as contemplated is attended by many perplexities. This is especially true in Minnesota, where agriculture and industry are close upon the heels of the forest and in many places penetrate it. The Forest Service, which is giving its best thought and sincerity, has a difficult task and a huge responsibility. Let us at least not cramp them in a niggardly policy of appropriations. Much larger funds are needed for research, planting, fire protection, and land purchase. Much patience and negotiation will be required locally. Yet, if the public interest is kept foremost and the main objectives are firmly pursued, there is no question but that conflicting interests can be reconciled with fairness and advantage to all. In this, as never before, the Service will have the support of a growing and enthusiastic public. The recreational uses are reinforcing the economic. The cold facts, which the Service has long preached, are becoming living truths to all who experience the peace and charm of the northern lakeland.

To what extent private timber holders within the area, in the use of their own forests, will conform to the principles of the proposed treaty, cannot be predicted. Much can be done to appeal to their pride and self-interest. They cannot be coerced. Colonel Greeley, former chief of the Forest Service, enunciated a valuable principle, when he said: "The time has come to go a step further in our conception of the rights of the individual as (*Continuing on page* 700)

Summering with the Elk

By Olaus J. Murie

(Photographs by courtesy of the Biological Survey)

Through the green, bright summer the velvet antlers are grown

IN recent years we have become accustomed to associating elk with wintry landscapes or starvation, and with good reason, in view of the elk problems which confront us. There is danger of obtaining an untrue impression, however, by the sole contemplation of their vicissitudes in winter and one may even come to feel hopeless over the situation. In the course of the study of the Jackson's Hole elk, under the auspices of the Bureau of Biological Survey, I have found other phases of elk life more pleasant to think about.

By way of comfort let us visit the summer range and see a brighter side of elk existence. Come to the Jackson's Hole country after spring has broken winter's grip, when the elk have scattered in the mountains, as far as the melting snow permits, and the fawning season is at hand.

One day I was hunting fawns, hoping to place numbered tags in their ears. It was early summer and birds were singing in the willows bordering Two Ocean Lake. But I pushed back to higher elevations, where snow still lay among the lodge poles of the north slopes and spring retained its cool freshness. As I came out of the timber and scanned an open hillside, I observed a cow elk feeding. In a moment three more were sighted higher up, and still another in the border of a willow patch. Any cow was at this time under suspicion and my first thought was "fawns." Where were they, and how was I to find them? A period of watching told me nothing and I decided to walk out in plain view and note the

Coming to a little lake in their retreat, the elk completely forgot their panic and went swimming. From my vantage point I could see them running up and down the little beach, jumping and kicking their heels

reactions of the animals, hoping they would in some manner betray the whereabouts of their offspring, or at least indicate the direction in which they lay hidden.

The cows in the willows disappeared from view. Upon catching sight of me, the group of three ran in alarm, but stopped to look back. Reluctantly, it seemed to me, they disappeared over the hill. The remaining cow reacted more definitely. She stood her ground and barked defiance. No question about her—there was a fawn somewhere in the neighborhood. But where? None of the elk had given me the slightest clue. This last cow, as I approached, retreated to the edge of the woods, but her attention was solely upon me, not on her fawn. I hunted diligently, combed the willows, the forest border, all the little knolls and nooks. Meanwhile the cow had quietly withdrawn. I seemed to have covered all the likely ground, and there I stood, apparently alone on a barren hillside.

Elk trails on the summer range. Winter hardships are now a memory, the first green tints of spring lie on the open slopes, and the time of plenty has come

After resting on a log, I wandered on over the hill in search of new territory, scanning the ground in all likely places. A slight brownish color drew my attention and I found myself looking squarely at a spotted fawn. There he lay, with head and neck extended, flattened to the ground. After watching him a few moments I proceeded to the capture. Slowly I drew near, partly crouched, all set to spring on the animal. He lay unmoving, his great eyes unblinking. I hitched a step nearer. He stirred very slightly. Later I was to learn the significance of this preliminary stir. In a moment he was on his feet, and before my muscles could react he was bounding away. Once more I stood alone. How many other fawns lay hidden on this slope I never knew.

In the evening, picking my way toward camp, I came to a bushy swale. In the center of it stood a spike bull, contentedly nibbling the tender foliage of the willows. Nearby was a beaver pond, really a small lake. Three male Barrow's goldeneyes floated lazily on the quiet water, their bright uniform of black and white gleaming in the lowering sun. In the forest an early thrush voiced the spirit of the season in soft, tranquil notes.

Winter hardships were now a memory. The first green tints of spring lay on the open slopes. Here and there in the wake of the retreating snow sprang up a legion of ambitious flowering plants, eager to face the new season. I had just passed a large company of anemones reveling in an oozy swale.

Yes, the time of plenty had come. Yonder spike bull could now pick and choose among the tender items of the new growth. In the lowlands spring had merged into summer, but the elk had voluntarily pushed on farther into the highlands, to follow the retreating snow. From now on they could be epicures. But why this freedom of the elk, this

We discovered another small group of elk in a green meadow directly below us. Feeding along steadily and comfortably, they were moving in our direction

abundance for a mere game animal? Our attention has so constantly been focused on their difficulties in winter, their winter forage needs and problems arising in that connection, that we are likely to be unaware that much has already been done for them. Their summer home is provided. The Teton Game Preserve, adjoining Yellowstone National Park, is the chief summer range of the elk, with abundance of choice feed; a haven during autumn when hunters are abroad. This area lies in the Teton National Forest and is dedicated largely to the elk herds. A study of the situation reveals commendable foresight. Here is a source of comfort. In this day of exploitation, when our own needs, fancied and real, are continually curtailing the freedom of wild animals, forcing them to live under cramped and unnatural conditions, which frequently necessitate a conflict with human interests, it is refreshing to find instances where an animal is permitted to live unmolested and is furnished with an ideal range. As for their fate in winter, that is another story. But we may rejoice that such wise provision has already been made for their comfort in summer, an instance of man's growing generosity toward the animal world which he has conquered.

The young fawn spends much of his time in hiding. I scanned the ground in all likely places looking for one, and suddenly a light brownish color drew my attention and I found myself looking squarely at a spotted fawn. There he lay, head and neck flattened to the ground

With a companion in July I climbed Wild Cat Peak and looked down the east slope. We discovered a band of elk in the pine timber of a low ridge. They were mostly cows and calves, with one or two spike bulls, resting among the trees. We took up our station on a high ridge, giving us a commanding view, where, with binoculars, notebook and watch, we might record their activities during the day. It proved to be a tedious task and we found little to record. The hot sun beat down on the open meadows and most of the elk had sought the shade. Little by little, we picked out the members of the little band. A small group here, another there, almost obliterated in the shadow of the trees. A flick of ears would reveal another partly hidden by a tree trunk. A calf would unexpectedly raise his head out of the tall vegetation. Occasionally one or two would arise and feed out on the sunlit slope, then lie down in a new place. We found that at least one or two would be feeding most of the time, but it was a lazy, drowsy scene. Hour after hour went by as we lay on our ridge, watch and notebook in hand, timing and recording the little events in a summer day of elk life. The shimmering heat waves blurred our eyes and we took turns at the binoculars. We became restless and continually sought new postures to ease our stiffening muscles.

Once a scrubby little black bear appeared in a meadow on the other side of our ridge. For diversion we abandoned our elk for the time and crept close to watch the bear grazing, following him to his retreat in a grove of white-barked pine. Here he became aware of us and promptly disappeared.

In the afternoon we discovered still another small group of elk in a green meadow directly below us. The first band had begun to emerge from the shadows and before long all the elk had assembled in the little green meadow. Soon nearly all were lying down again, many of them sinking out of sight in the heavy vegetation—tall grasses and blue masses of Mertensia. Some would be feeding nearly at all times and frequently a calf would run to its mother to nurse for a few minutes, until the mother moved off unceremoniously. The evening shadows crept over the slopes and we could feel the chill of night coming on. The animals were a little more active, but still they moved leisurely. Literally wallowing in forage, there was no need for haste, no eagerness in their feeding. Sleek and glossy of coat, plump and fat, truly they were in elk paradise.

Let us pick another summer day. In the cool of early morning we climbed a steep slope and gained a partly wooded ridge, known to us as a favorite feeding ground. We worked along slowly until we heard the tell-tale squealing of calves, a band of elk on the move. The wind was right and a quick detour brought us to the lower edge of a patch of woods, camera ready. Two cow elk were feeding unsuspectingly fifty yards away and we could hear the calf squeals signaling

the approach of the main band, out of sight below the contour of the slope. A head bobbed up in view, then another, ears were pointed inquiringly. Then came others, more and more of them, until they poured over the rise like a close-ranked army. Feeding along steadily, comfortably, they moved up in my direction and the camera clicked. The early morning sun slanted its beams through the ridge-top trees above us. Beyond this delightful scene we looked down on forests stretching away to the blue valley of Jackson's Hole, and beyond to the towering Teton range.

I suppose it was a little pocket gopher at my feet, making a hasty foray after a green leaf ten inches from his burrow, which caught my notice and caused some careless movement of my head. Some sharp-eyed elk came to attention. A moment of staring wonder, a battery of questioning ears, then a pounding of hoofs and they were gone.

But there was to be yet another picture. Following the general direction of their retreat we were soon rewarded. They had come to a little lake. Promptly they forgot their panic and went swimming. We had good cover and hurried excitedly to the edge of the woods overlooking the little lake, catching a glimpse now and then of a splashing in the water.

From my hiding place I looked out. Up and down the little beach elk were running, jumping, kicking up their heels in sheer joy. Some went splashing through the shallow waters, some stood belly deep. Calves were swimming about. For pure animal enjoyment this was supreme. I can offer no better experience to illustrate the well-being of elk on summer range.

Bittersweet

By P. L. Ricker

ABOUT this time of the year the markets are gay with colorful sprays of Bittersweet. Many people bring it home for decorative purposes, a vine with yellow to orange colored, somewhat spherical fruits about three-eighths of an inch in diameter, but vertically ridged with three (sometimes two or four) slightly raised ridges. This is the climbing or shrubby Bittersweet (*Celastrus scandens*) and should not be confused with the true Bittersweet, also called climbing or Bitter Nightshade (*Solanum dulcamara*), a common introduced European weed with blue, purplish or rarely white flowers and a red berry.

Photograph by E. L. Crandall

Bittersweet, showing the gay berries which make the plant so popular for home decoration

The climbing Bittersweet is found mostly in rich soil along mountainous sections of the country from Quebec to North Carolina west to Manitoba, Kansas and New Mexico. After the first frosts the fruits split along the ridges and open, revealing a showy red berry containing two to four small seeds.

In many localities the climbing Bittersweet is found in great abundance, festooned over the trees and bushes in dense tangles to a height of ten or fifteen feet and a quarter of an acre in extent. With the falling of the leaves of the trees and the opening of these fruits the dense masses of vines and red berries are visible from quite a distance.

Where these plants are found in such abundance there can be little harm done by collecting a moderate quantity of the attractive berried vines for home use. But be sure to be moderate and take only a small amount, for many other people will do likewise, and if a large part of the fruiting branches are taken away there will not remain a sufficient amount of seed to maintain or increase the number of plants in the locality. Many plants die out every year from natural causes. In many wild plants only one seed in ten thousand or more ever germinate, and a much smaller proportion ever reach maturity. The fruits of the Bittersweet are much sought after by birds, which digest only the fleshy portions, scattering the seed far and wide. Bittersweet is an important element of the winter food supply for the birds that remain in the mountainous regions all winter. The fruits begin developing the last of August, reach full size and color in September, bursting the outer coating by the last of that month and, unless taken by bird or man, or thrashed off by the winter winds, often remain on the vines until early spring. Many of these and similar seeds falling to the ground are used for food by insects and small rodents. Countless others never germinate because some insect lays its eggs in or on the young fruit, the germ of which is eventually eaten by the larva.

The Bittersweet is readily propagated from suckers, by fall layering, or the ripened cuttings will root freely in a compost or loam, peat and sand. The seed are best sown in the fall, as they germinate much more readily in the spring if they have been exposed for several weeks to low temperatures or freezing, with occasional periods of thawing. This can also often be done artificially in five or six weeks.

FOREST PEOPLE

John Fensel's Woodlot

Anyone With "Horse-Sense" Can Make Forestry Pay, Says Indiana Farmer

By R. F. WILCOX

John Fensel's woodlot in winter

"WHERE did I get my idea of forestry?" The farmer chuckled as he repeated my question, and looked proudly at his beautiful stand of trees. "I don't know, except that it is plain 'horse-sense.' Anyone can make a woodlot pay better than cultivated ground if he will only use a little common sense."

I looked at John F. Fensel, the farmer, in astonishment. I had been told that his twenty-acre woodlot at Montpelier, Indiana, was one of the best managed stands of timber in the state, and that his forest was the first to be classified under the forest classification law, enacted in 1921. The thing that astonished me was the simple and direct way Mr. Fensel had accepted forest management and his unquestionable faith in it.

"Perhaps my interest in trees was inherited," he explained as we started to walk toward his grove. "My grandfather was a forester in Europe and all of us have always had a love for trees. My first recollection of a tree is of a redbud in bloom when I was three years old. I get a thrill every time I see one."

As we approached the woodlot I was impressed with the remarkable growth of the trees. The most striking feature, however, was the prolific reproduction of young forest trees and seedlings which covered the forest floor. Where a mature tree had been removed the opening had quickly filled with second growth. The whole woods showed the characteristic vigor of an unpastured and fully-stocked Indiana forest. I could not keep back words of admiration.

"Just common sense," Mr. Fensel responded. "I had no instruction in forest management until 1921 when Charles C. Deam, then State Forester of Indiana, drafted a law to conserve the forests and got it passed. Mr. Deam inspected my property and gave me a few pointers, although he said at the time that I had the best managed forest in Indiana. Now, of course, I get plenty of literature on forestry that is very helpful. But primarily, forest management is just plain 'horse-sense.' "

To emphasize the reward in farm forestry, Mr. Fensel took me to another woodlot adjoining his, owned by his brother. This area was heavily pastured and the stand was becoming open enough for wire grass and weeds to grow, and there was no reproduction whatever of tree seedlings.

The woodlot was "farmed" by common-sense methods. Fire was kept out, weed trees removed, and the healthy ones given every opportunity to make good

"I pastured my stand one year before I found out that it was not the way to build up a forest," Mr. Fensel said, gazing sadly at the violated forest floor of his brother's woodlot. "You can't make money in trees by having sheep and cattle killing the young growth and damaging the old."

"You have made money on your woodlot?" I ventured.

He nodded his head. "A little; more than I would have made by cultivating the twenty acres."

He waited for a moment to examine a young seedling, then continued: "In 1881 I bought forty acres, covered chiefly by brush and willows. In one corner, however, there was about an acre of good trees—all kinds of hardwood. I took good care of this little stand rather than cut it. About 1900 I bought twenty-three acres across the road for $650. All of the merchantable trees had been cut with the exception of a few seed trees. So with this beginning I started out to build up a forest.

"With the exception of one year, I have never pastured my woodlot, and I have kept the stand free from fire. I cut out 'weed trees' and those that show decay, using the wood for fuel. I save every twig as big as my finger for fuel, although many people laugh at me, saying that I have more wood than I can use in a lifetime. I just tell them that there may be some people after I am dead and gone that will need wood. I am not like the boy who wept because he could not eat all of the melons in the patch at one time.

"Well, I just farmed my woods as common sense directed me. I kept it clean just like any farmer keeps a cultivated field clean of weeds, never allowed a tree, large or small, to be crowded out of its life, and culled, or thinned the cripples. The healthy trees are the real pay trees.

"Has it paid me? Well, let's see. The twenty-three acres cost me $650 in 1900. I have cut enough timber from the woodlot to build two barns and a corn crib, a cow stable, a woodhouse, a chicken house, and a garage and summer kitchen. For a good many years I have been selling about forty cords of stove wood in the fall. This brings me about $120 every year. I also cut about $40 worth of fence posts every year. In 1918 I sold about fifteen cords of ash for handles for $400. In 1924, ten thousand feet of elm was sold for barrels. This brought me in $300. I sold about $150 worth of saw timber last year. Do you think it pays?"

From a small beginning, and with the right care, prolific reproduction resulted in the building of this beautiful forest

I did, especially when I remembered that the small woodlot was undoubtedly considered waste cut-over land at the time Mr. Fensel started applying "horse-sense" twenty-eight years ago.

"No, it's not bad for a small woodlot," Mr. Fensel agreed after I had expressed myself. "But there is another item. I have just refused $3,000 for the standing timber."

A University of the Wilderness

(*Continued from page* 693)

compared with the interests of the people as a whole. Lands which contain important natural resources can no longer be viewed as merely the property of their owners, with no obligation to the welfare of the country at large. Rather should they be regarded in a sense as public utilities." Forward-looking and prophetic!

In preparation for the time when treaty arrangements may be possible with Canada, steps have already been taken to protect and round out Superior National Forest. The so-called Shipstead-Newton bill, which seeks to apply some of the principles of the proposed treaty to the Minnesota area, has already been favorably reported by both Houses of Congress and will come up for final action this winter. In furtherance of its objects 26,000 acres of remaining unappropriated federal lands within the area have already been withdrawn from public entry by temporary executive order. It recognizes the paramount importance of the beauty of the natural features and shore lines of the lakeland, including rapids, waterfalls, islands, and beaches, and forbids further alteration of natural water levels without the consent of Congress. In other words, the bill is a declaration of public policy, withdrawing the area from the provisions of the Federal Power Act. As such, it represents a notable advance and its speedy enactment is urgently needed.

The economic advantages of the Quetico-Superior program, great as they are believed to be especially for Ontario and Minnesota, cannot be discussed here. The plan, while it subordinates economic values to the higher social uses wherever there is a real conflict, does not ignore or lock them up. Instead, it seeks to make them permanent.

The original suggestion of international action, made by Ontario citizens, has brought an enthusiastic response from the United States. The program of the Council on its merits has won overwhelming public support. It has secured the considered endorsement of practically every national conservation organization as well as of men and women from coast to coast of every shade of opinion and every attainment. A great board of advisers has been formed, made up of scientists, writers, artists, humanitarians, and men of affairs, all of them interested in one aspect or another of this many-sided and far-reaching project, which Arthur Hawkes has significantly called "an outdoor university with a campus of 14,500 square miles."

Well may it be called a university—a university of the wilderness! There is little else left of the original school that formed the character of our pioneer race. It is a museum of original America. It contains the larger half of wisdom—the part that cannot be taught within-doors.

That those two nations should now wish to dedicate a part of their peaceful boundary to the enjoyment of both peoples is itself a work of peace. If it can be achieved, has not something worthy been gained in the comity of nations? What wonder then that the American Legion of Minnesota at its recent annual convention proposed that the area be dedicated as a peace memorial to the ex-service men of both countries, who fought as comrades in the recent world war!

The lakes of Verendrye! The same that brought the early explorers, singing the songs of France! They lie sparkling in their mid-continent seclusion, linking us with the primeval past of America and promising sanctuary for all time to unborn multitudes.

Kermit Roosevelt says that, when things were black, his father would often quote Jasper Petulengro in Borrow's *Lavengro:* "Life is sweet, brother . . . There's day and night, brother, both sweet things; sun, moon, and stars, all sweet things; . . . and likewise there's a wind on the heath." The vision of a Roosevelt not only yearns for the things of the spirit but derives from them.

James R. Garfield Heads Public Land Commission

James R. Garfield, who served as Secretary of the Interior under President Roosevelt, has been named by President Hoover to head the commission to formulate a national land policy. The Commission has before it the task of deciding the feasibility of turning surface rights of the public domain over to the public lands States, a proposal which Secretary of the Interior Wilbur made to the governors of those States several months ago. Other members of the Commission will not be named until further recommendations have been made, it was announced.

Under the plan the Federal Government would cede to certain western States the control of all surface rights to public lands with the exception of the National Forests, National Parks and National Monuments. Secretary Wilbur said that even the National Forests might be turned over to the States if proper conservation legislation was passed by the various State legislative bodies.

Former Secretary Garfield is a native of Ohio, and son of James A. Garfield, twentieth President of the United States. He was formerly a member of the Ohio legislature, and was in 1902 a member of the United States Civil Service Commission. Since 1909 he has been engaged in private law practice in Cleveland, Ohio.

Forestry In Los Angeles Schools

By Virginia June

THE winning of a forestry division for the schools of Los Angeles and the work which has been accomplished during its brief history, is a story of educational progress in teaching conservation of our natural resources, without parallel in any public school system in the United States. The first steps toward organization of the work were taken in the late autumn of 1925. For some time previously a belief had been growing among leaders of agricultural and vocational work, that the city schools were well prepared in both the training of their pupils and necessary equipment in the elementary agricultural and vocational schools, to expand their activities into the field of forestry and to create a forestry unit to function on its own responsibility in association with these departments.

Los Angeles school children arriving at their forestry center in their own truck

Getting acquainted with the young trees in the County Forest Nursery

Pine seed are planted in a large burned-over area near their camp

Mrs. Susan M. Dorsey who recently resigned after fifty years of executive and teaching service was then superintendent. I sought to learn what her part had been in securing this important addition to the educational system. The former superintendent firmly disclaimed any credit for the work of which she is so proud.

"The men came to me," she said, "and we were ready." Smiling, she continued, "Our children have been taught how to prepare soil, how to gather and treat seeds. During the World War the children of Los Angeles schools gathered fifteen hundred pounds of castor bean seed for the government. The children know how and when to plant seeds, how and where to plant shrubs. They have planted many about their own school buildings and on their school grounds. They know many things about plant culture. Many of them—not all—know how to graft one plant

"But you, Mrs. Dorsey, as superintendent, must have helped to make it possible?" She looked into my eyes, sincerely concerned to place credit where she believed it due. "I went to the board, yes, but I do not deserve any credit for what has been accomplished. The supervisors, Mr. Fultz and Mr. Tanner, have done all of the work, they have worked out all of the details. I am very proud of this report." The former superintendent held in her hand the forestry report for June 1929 and with her rare smile she continued: "I was born to beauty. I love trees more than any other form of vegetable life and next to trees, shrubs."

Forty-eight years ago Mrs. Dorsey brought from her home in the beautiful region of the Catskill Mountains a love and enthusiasm for every green living thing of the forest. In her adopted home in the Southwest, she was quick to appreciate the importance of forested and brush-clad mountain slopes, upon which Southern California is dependent for water, to the social and economic welfare of every man, woman and child of the state. With her sense of readiness, then, this is what really happened.

On November 30, 1925, the superintendent went before the Board of Education, with full knowledge of conditions and her own convictions as to the responsibility of the educational system for enlightening the school children on the imperative need of mountain cover conservation. She urged that the children be given the opportunity to get the mountain situation, to become mountain-minded and to acquire some forestry knowledge as a basis for college training if they wished to choose that vocation. Particularly did the former superintendent urge a forestry division as a means of training for better citizenship. On this point alone, results have richly repaid all forestry effort expended. In placing the matter before the board, Mrs. Dorsey requested the appointment of two assistant supervisors to direct the activities of the new division of agriculture. She

presented the names of Francis M. Fultz and William R. Tanner to share the responsibility. Mr. Fultz for ten years previously, nature student, lecturer and writer, author of "The Elfin Forest" and other botanical works, was formerly superintendent of the schools of Santa Barbara. Mr. Tanner, teacher of English and former President of the High School Teachers Association had for several years interested himself in conservation, reforestation and wild flower propagation. The Board acted favorably upon the requests of the Superintendent, and on December 3, 1925 recommended that forestry instruction and field work begin at once.

Unaware of the impending forestry organization and his own approaching appointment, Mr. Tanner had some weeks earlier in the season conducted an expedition of junior and senior high school boys into Topanga Canyon in the nearby Santa Monica Mountains, to search for seeds of chapparal and native trees for planting in a burned-over area in the nearby mountains. Although the normal season of seed gathering was several months past, a large amount of seed was secured, brought to the schools and cleaned by both boys and girls who had been interested in the project. The seed was deposited in two treasure chests especially designed for use at a forthcoming occasion, namely a football rally to be held in late November in the auditorium of the Manual Arts Building. Mr. Tanner secured just four minutes on this program. With two seed pirates kneeling on the treasure chests beside him in the center of the stage, he made an earnest appeal for the conservation and reforestation of the mountain slopes, and drove home what it means to the boys and girls of today and what it will mean to those of the next generation. Youth made the building ring with its approval and applause. The rally was repeated and the auditorium twice filled. Several thousand pupils were thus reached. While not a direct effort toward interesting pupils in the forestry project—as yet unorganized—it was one of the effective means of arousing interest. Incidentally the "treasure" seed was sown on a burned area during the next growing season.

As a first measure toward the new forestry organization the selection of a suitable tract for a first camp-base and experiment station was begun immediately following the order of the board. With the active interest and cooperation of the supervisor of the Angeles National Forest, a tract of five acres was selected on the Clear Creek branch of the Big Tujunga River. This small tract was chosen in the midst of a 7,000 acre area burned over in 1924 and again in 1925, a few months before the school took possession. It lies directly back of Mt. Lowe and Mt. Wilson in the Sierra Madre range, and was especially desirable because of available water rights, suitability as a propagating center and other advantages. A temporary assignment was made by the supervisor until a lease by the United States Forest Service could be arranged.

High School students building dormitory at the Clear Creek Forestry Center

Erecting a rock wall, part of the plan to beautify their forestry camp

First-hand information on forest fire damage is given the students by a forester

Interested in the school movement, the county forester and the state university nurseries at Berkeley contributed young trees for the first planting. In December a call was sent out over the radio for California Holly Christmas decorations to be collected after the holidays. From this beautiful canyon shrub which is not holly at all, but Christmas Berry—Photinia—and more commonly known as "Toyon," a fine lot of seed was salvaged. Several lots of seed were received from out-of-town friends of the school, including holly from Oregon and toyon from San Francisco.

That the children might see the effects of fire in the mountains and take part in the planting of mountain cover, the Board of Education authorized twenty-five bus loads of children be taken up to the camp, the trips to be arranged on the regular agricultural days. In February the one day trips were begun. With their teachers the pupils were transported to the foot of the trail, from which the sturdy climb was merrily made to the forestry center. A road which crosses the tract near the boys' camp has since been constructed, adding to the convenience of the young foresters, and simplifying transportation and the hauling of materials for the construction of buildings.

It was in the spring of 1926 that the real adventures began and the thrilling life of the mountains, with the zest of actual achievement, drew more and more boys into the forest work until the rivalry in tree planting developed into spirited

contests to determine who could plant the greatest number of trees in a given time. The work rule is not less than two hours in summer and three in winter for all pupils who come to camp. With the late start the first planting season was necessarily very short, but for all pupils who could go out on Saturday or other days, there was plenty of preparatory work to do. Up to July 1, 1926, over 700 pupils had visited the camp.

With vacation days at hand the real business of construction for their forestry center began. Those who remained over night slept in their blankets in the open. Keen appetites whetted by steady work on the job and the exhilarating mountain air, were satisfied by food brought up by the boys or cooked on boy-made stoves out of doors. Much of the material used for buildings and a great deal of the equipment for camp and nursery were salvaged from the city schools storage yard. In the organization of the work the board provided a new truck for hauling and furnished new equipment as needed. The boys, whose ages range from twelve to eighteen years, enjoyed exercising their mechanical skill and ingenuity. Since the summer of 1926, temporary sleeping quarters, a dormitory at lower camp, wash house with four showers, screened kitchen, store house, garage, blacksmith shop, shelter shed for two burros and various small buildings have gradually been added. Beds, blankets and cooking equipment for forty boys are now available.

In April 1927 the original special use permit was extended by the Forest Service to include 250 acres, with free water rights, so as to make possible an expansion of the forestry work. The entire section is now officially known as Los Angeles Schools Clear Creek Forestry Center. The San Fernando High School has built its own cabin at the forestry center and other high schools of the city have chosen sites and made clearings for their own group of buildings. The forestry and agriculture instructor, William T. Sterling, is carrying two full-time forestry classes of twenty pupils each at San Fernando High. This school is equipped with propagating beds and because of its location in the valley has unusual facilities for carrying on forestry studies. Several pupils now in their third year, have chosen forestry as a vocation and will take college training.

Seed for planting is gathered from the forest by the High School boys

Receiving practical instructions in the art of planting seedling trees

Time out for lunch and everybody ready for their bacon and beans

One of the most strenuous and exciting tasks has been the building of trails. It takes a "number one" brand of enthusiasm, with unlimited persistence to build a mountain trail. The route must first be carefully selected for the easiest and most convenient way, then marked off, stones removed—usually these are numerous—much scrub oak hewed out of the path four to six feet wide according to conditions. Then there are thrilling moments such as when rattlesnakes resent being disturbed. The boys like the trail building and get many thrills out of their pioneering.

At the conclusion of the school year in June of this year the boys had made, with the aid of the Federal Forest Service, four miles of trail and one mile of road. They have helped to make four miles of telephone line and have cleared brush lands and made fire lines in their area. They have also constructed 2,400 square feet of seed beds for nursery stock. Groups of boys from the summer playgrounds taken last year on two-day trips were very helpful in seed gathering. The fall ripening seeds were gathered by one-day groups of junior and senior high pupils and by pupils of the out-lying elementary schools favorably situated for the work near the foothills. About fifteen hundred pounds of seed of various sorts were thus gathered.

Propagation of native trees and shrubs at the center during the past year proved unusually successful. There are now 18,370 seedlings in the beds, comprising twelve species of native trees. Propagation of native trees and shrubs has also been carried on to a varying extent at fifteen high schools, nine junior high schools, seventy-five elementary schools, and six agricultural centers. Approximately 10,000 plants have been raised at these various gardens, nearly all of which will be used in school-ground planting in conjunction with the landscape division of the city schools. There are now at the Franklin Nursery of the landscape division 4,000 potted trees and shrubs, ready for use during the coming season. As a civic service 300 potted native trees and shrubs have been furnished to the Southwest Museum, where they

were planted on the steep hillside below the building by the museum gardeners, who have watered and taken such good care of them that the loss has been very small.

The mountain planting season is from October to March, during the California season of rainfall. The three phases of forestry work, seed gathering, propagation and planting, have been vigorously carried on each year. The programs vary according to rainfall, especially in outside seed planting, but much of this was done at the city schools agricultural centers. Owing to the excessive and long-continued dryness of the seasons, planting in the burned-over area has been greatly hampered and has not proceeded as rapidly, nor with as great success, as the directors have wished.

With the growth of the new forestry division two forms of service, physical and educational, have permeated its entire organization, creating influences which can not easily be measured. During the past school year 1,528 pupils and 143 adults visited the Clear Creek Center, making a grand total of 4,808 visitors since the establishment of the project. The pupils came from twenty-two elementary, thirteen junior high, and sixteen high schools. "Do not mistake the word 'visited,' " cautioned Mrs. Dorsey. "Those children, every one of them, worked." The real visitors came from six states of the union, the Philippine Islands, England, Russia and Switzerland.

The educational work in lectures, moving pictures and exhibits designed to create active and co-operative interest in conservation and progressive forestry, have been broad in their scope. At the end of the school year last June, approximately 20,000 persons had attended the illustrated lectures given by the two assistant directors. Forestry films were loaned to twenty-four additional schools and a splendid motion picture made by the County Forestry Department, showing the boys at work and telling the story of the Sunset Canyon fire and flood, was shown before 18,000 students in twenty-eight city schools.

On Boys' Day in Citizenship, the Federal and County Forest Services and the County Flood Control took twenty boys from the forestry clubs for positions of importance and interest. The boys made acquaintance with and gained knowledge and inspiration from the men with whom they came in contact. This they endeavored to communicate to their associates upon their return to the respective junior and senior high schools. How many embryo forest rangers are now in training under the leadership of the assistant directors cannot even be guessed. Some of course are more seriously interested than others. But there is no question as to the future of the Clear Creek Forestry Center. Mr. Frank A. Bouelle, who recently succeeded Mrs. Dorsey as Superintendent of Los Angeles schools, is a noted conservationist, as enthusiastic a lover of trees as his predecessor and an educator under whose administration Los Angeles schools will continue to make forestry progress.

Lost! A Forest Ranger

(*Continued from page* 686)

Four miles above the confluence of Burnt Log with Johnson Creek is a dilapidated log cabin used as a noon stop by the mail carrier on his bi-monthly trips to Yellow Pine. If he could gain that cabin there might be some scraps of food, certainly it would afford shelter. Stumbling and falling, the exhausted man followed the strand of telephone wire faintly visible in the starlight. He longed to lie in the snow and rest; to end this horrible nightmare which he had endured for three days. Only an indomitable will enabled him to struggle toward the cabin.

He found the door ajar and the floor covered with snow. But the crude fireplace soon roared with a flame that lighted the room, revealing a general state of disorder and casting fantastic shadows over the walls. All this was lost to McConnell who dozed before the fire until its slowly dying embers failed to dispel the cold. He replenished the fire and looked about for food but could find only a little coffee, some sugar, and a can of frozen milk. Soon a bucket of coffee was boiling over the fire and he was planning for tomorrow.

Fourteen miles above this cabin was the Penn Basin ranger station. There was food, telephone communication with the outer world, and safety. To a man in his weakened condition this long hike through the snow seemed an impossible task, but to linger at the cabin was certain death for he could not possibly survive until the mail carrier returned.

He coated the skis with some wax left by a former occupant and took up the snowy trail at daybreak. The prize was life, while the forfeit—well they would find his body anyhow and that was more than could be said for many a soul lost in these mountains. He traveled slowly and rested frequently, using every opportunity to husband his strength. The miles seemed endless, while the ephemeral hours slipped away to bring darkness before he could realize that another day had passed. He struggled on through the night until he emerged into the familiar meadows on Johnson Creek, a short distance from the ranger station.

Low clouds had obscured the stars and began to spit snow, until it was impossible to see more than a few feet ahead. As if bent upon annihilating him the storm broke in full fury and McConnell staggered forward, actually aided at times by the blizzard. But he could see nothing and wandered aimlessly about the open meadow fully expecting to perish upon the very threshhold of shelter. He trippd over some invisible object in the snow and fell heavily, only to find that it was the top wire on the pasture fence. It dawned slowly to his dazed brain that the fence would lead him to shelter which was evidently not far away. A dark object loomed dimly through the wall of snowflakes and a few minutes later McConnell stumbled through the door of the Penn Basin ranger station to safety.

Knowing and Treating Tree Diseases

By G. H. Collingwood

Although their menace is appreciated by few, tree diseases are drawing increasingly upon America's timber resources. "KNOWING AND TREATING TREE DISEASES" is the sixth article of a series written to provide simple but needful information on the care of trees. The first of the series appeared in the May issue, and other articles of vital interest to the owner of trees or timberland to follow are:

The Why and When of Tree Pruning
First Aids in Tree Surgery
Shade Trees, Their Kinds and Care
Trees for the Roadside
The Making of a Town Forest
Memorial Trees and Groves

Each article has been systematically planned in relation to the whole series.—Editor.

LESS spectacular than forest fires, less spectacular even than insect pests, is the battle being waged against tree diseases that spread often unnoticed through the forest. Their menace is appreciated by few, yet tree diseases are drawing increasingly upon America's timber resources.

Disease may be defined as an unbalancing of normal functions. This may be the result of insect attacks or by climatic, biological or soil conditions, but this article will deal with tree diseases as caused by fungi and mistletoe. The profession of forest pathology is comparable to the profession of medicine, but, in spite of advances that have been made, is still in its infancy. It is comparable with the medical profession a century ago, when crude practices of disease control, rather than prophylactic measures based on exact knowledge, maintained. "Forest sanitation" and "forest hygiene" are phrases we are going to hear more and more as wiser forest policies are enforced.

As in the case of insects, many of our most disastrous and menacing tree diseases have been unwittingly imported from foreign lands. The United States depends largely upon federal and state quarantine measures to prevent the importation and spread of foreign tree diseases, but these have not been wholly successful. White pine blister rust, larch canker and chestnut blight are three outstanding examples, and the Dutch elm disease, although it has not been recognized in this country, presents a serious problem. It has caused the death of thousands of elms in Holland, Germany and England and is a constant threat to the elms of this country. About 7,500 fungous diseases destructive to trees and plants on other continents have not yet reached the United States, but many of them will arrive unless careful barriers are maintained.

Newly introduced diseases can sometimes be eradicated by destroying all infected trees and by maintaining an absolute embargo on trees from the danger zones. Shipment of timber products must often be restricted also. Chestnut blight and Dutch elm disease are examples of fungi that can be transported in lumber products for some time after manufacture.

Chestnut blight was imported on young trees from Asia, sometime prior to 1904. It got beyond control early in the battle and has spread over practically the entire range of our American chestnut. Probably, within another generation the entire native species will be wiped out over a region extending from southern New Hampshire, across New York and part of Michigan, Indiana and Kentucky to northeastern Mississippi and northern Georgia. While prompt detection of the disease and ruthless destruction of all infected specimens might have halted its march, no control suitable for checking its spread was devised after it got under way.

Inadequate safeguards were responsible for the importation and spread of white pine blister rust. Its introduction into North America might have been prevented had the federal Plant Quarantine Act been in effect twenty years ago. The disease is believed to have originated in northern Asia and to have been brought into Europe by way of Russia, on young trees planted in botanical gardens. From Russia it has been tentatively traced to botanical gardens in European cities, such as flourished from 1750 to 1850, sponsored by wealthy noblemen, physicians and rulers. Since little was known of fungi and their distribution, foreign plants were freely introduced by exchanges and conditions were ideal for spreading plant diseases.

As early as 1898 blister rust was recognized at an important nursery center in Belgium that traded into Germany, France and other countries, including the United States. It was first discovered in this country in 1906 on white pines imported by a Massachusetts firm. A total of about 226 lots, all con-

Left, a shelf fungus on a tree trunk. Right, inside the same tree, showing typical heart rot. The shelf fungus bears spores which are the means of spreading the disease to other trees.

taining infected stock, were definitely traced to one German firm. Dr. Karl von Tubeuf, a professor at the University of Munich, warned that diseased stock was being distributed freely throughout Germany by this nursery and tried unsuccessfully to have the plant traffic controlled.

White pine blister rust is a fungous disease that requires an intermediate host for its development and spread. Herein lies the secret of its control. The disease cannot spread from one pine to another, but must have the leaves of currant or gooseberry bushes as stepping stones. From infected pines the spores spread to currant and gooseberry bushes. When these intermediate hosts are destroyed its ravages are stemmed. On pines the disease evidences itself in canker spots along the bark—swollen patches with a greenish yellow discoloration about the edges. After about three years orange-colored blisters filled with millions of spores break through the canker. The spores are scattered on the wind for hundreds of yards, and out of the many turned loose, a few fall upon the leaves of currants or gooseberries. The broken bark around the blister dies, but the fungus grows on in the live bark, producing new blisters each spring. "Spring spores" form orange-yellow spots on the under surfaces of the leaves of currants and gooseberries. Later these same leaves develop hair-like growths called "fall spores" which are carried back to the pines.

Above, in some areas Mistletoe is a forest enemy comparable only to fire. It depends upon its host for food and moisture, and gradually kills the tree. Below, characteristic galls of Woodgate rust upon Scotch pine. Forest pathologists declare this holds a potent threat for the Southern pines.

Blister rust at the present time is found in the white pine forests of the New England states, in New York, New Jersey, Pennsylvania, Michigan, Wisconsin, Minnesota, as well as in the western white pine forests of Idaho, Washington and Oregon. It is also found in British Columbia, Ontario, Quebec, Nova Scotia and Prince Edward Island, Canada. In these forests it attacks and kills white pines of all sizes. In a badly infected region it is often known by the rust-colored "flags" of diseased and dying branches. The greatest menace of the white pine blister rust is to the young growth, but too many large trees have also been killed for one to doubt its potency. Since the white pines represent timber resources of at least $550,000,000 and since it is highly desirable for artificial planting, the importance of controlling the rust is apparent.

White pine stands can be protected by uprooting all currant and gooseberry bushes within infecting distance—nine hundred feet under average conditions. The bushes can be uprooted either by hand or with a grub-hoe, but the work of eradication must be systematic and thorough. Crews of two or more men are effective, but one or two careful workings of an area are essential. Recent studies have shown dip oil and fuel oil to be effective in killing off currant and gooseberry bushes. This is applied by men carrying knapsack spray pumps, similar to fire extinguishers.

During the past eleven years nearly seven million acres of land in New England and New York have been made safe for white pine by cleaning off the currant and gooseberry bushes at an average cost of twenty-one cents an acre.

Another unwanted immigrant is the European larch canker, a disease recently discovered in Massachusetts and Rhode Island. Its appearance has greatly agitated forest pathologists, because while it mutilates and kills American and European larches, like other imported pests, it behaves differently in this country. It has gone beyond the larches and attacks Douglas fir and yellow pine, two of the most important timber trees of this country. Should the disease escape control it could spread through the larch forests to the great forest regions of the northwest, for the larches form a bridge for it across northern United States and Canada to the Pacific Coast.

Control consists of cutting down and burning infected trees as fast as these are found and a rigid quarantine prohibiting the movement of seedlings and timber of affected species from the two states. Scientists from the United States Department of Agriculture have been assigned to study the disease and neighboring states are being scoured to determine whether there are any additional infections outside the known danger zone.

Larch canker is similar to chestnut blight and is equipped to spread rapidly. It attacks through the bark, forming a canker which quickly girdles and kills small trees. Large ones are killed more slowly. The ugly growths on the trunks spoil the wood for timber and so weaken the trees that they are subject to insect attacks or snap during a storm or under the weight of snow. The disease spreads from one tree to the next and the spores may be carried by the wind, insects, birds or small animals. Resin flowing from the point of the wound sometimes covers the trunk for a distance of ten or fifteen feet.

A comparatively new and little known disease is Woodgate rust, so called because it was first discovered on Scotch pines at Woodgate, New York. This disease attacks only hard pines, producing knob-shaped swellings, or galls, on the stems and branches. It stunts and malforms the trees, eventually killing them. This fungus has no alternate host but spreads directly from tree to tree which makes control difficult and expensive. Thus far it has been confined to New York State, but several of the Southern pines are particularly susceptible to it. This fact coupled with its power to spread from tree to tree causes some forest pathologists to refer to it as our most menacing pine disease.

This disease was discovered in 1925, but the age of the galls indicate that it has been present for at least thirty years. The studies show that the rust made little progress until 1920, then began to spread very rapidly. Little is known concerning its original source.

Damping-off, a disease of the nursery, causes heavy losses in thickly sown beds of conifer seedlings. It is caused by a variety of fungi whose classification is still incomplete, and is often confused with damage caused by wind and heat. In the latter case, however, the shriveled base of the stem is light-colored and above the ground line, while in damping off the stem is dark in appearance and shows an extension of decay at the roots.

Damping-off can be partially controlled by sowing seed less densely, by avoiding heavy or excessively wet soil, and by good ventilation in the seed bed. Fall sowing or very early spring sowing in northern nurseries is also recommended rather than late spring sowing. Some growers have found that sub-soil from the forest, used as a surfacing for conifer beds, acts as a preventative. However, there are so many different fungi that cause the disease at different times and places that it is impossible to recommend any one treatment as generally effective. The large-scale grower will find it profitable to experiment with different treatments on small seed plots to determine for himself the best method of control and the proper concentration of any chemical disinfectant that may have been employed successfully elsewhere.

Tests conducted over a period of years have shown solutions of sulfuric acid to be effective, but because of its corrosive tendencies its use has sometimes had disastrous results. Aluminum sulfate at the rate of one-half ounce to a square foot has been recommended as a non-corrosive substitute. Good results have followed when it is applied to the bed at the time of seed sowing. It can be dissolved in water and sprinkled onto the soil or the powder can be scattered and washed in with water. The cost is reasonable and like sulfuric acid it helps keep down weeds. When neither the acid or sulfate seem effective, formaldehyde at the rate of three-eighths of a fluid ounce to a square foot will sometimes solve the problem. This should be dissolved in water and applied ten days before sowing. Other mixtures that have been used successfully include compounds of mercury and Bordeaux mixture.

Above, fruiting bodies of fungous growth which entered after fire had destroyed portions of the protecting bark. Left, an example of root fungus. In each case these are merely evidence of damage being done beneath the bark by root-like fibers which penetrate into the woody structure of the tree.

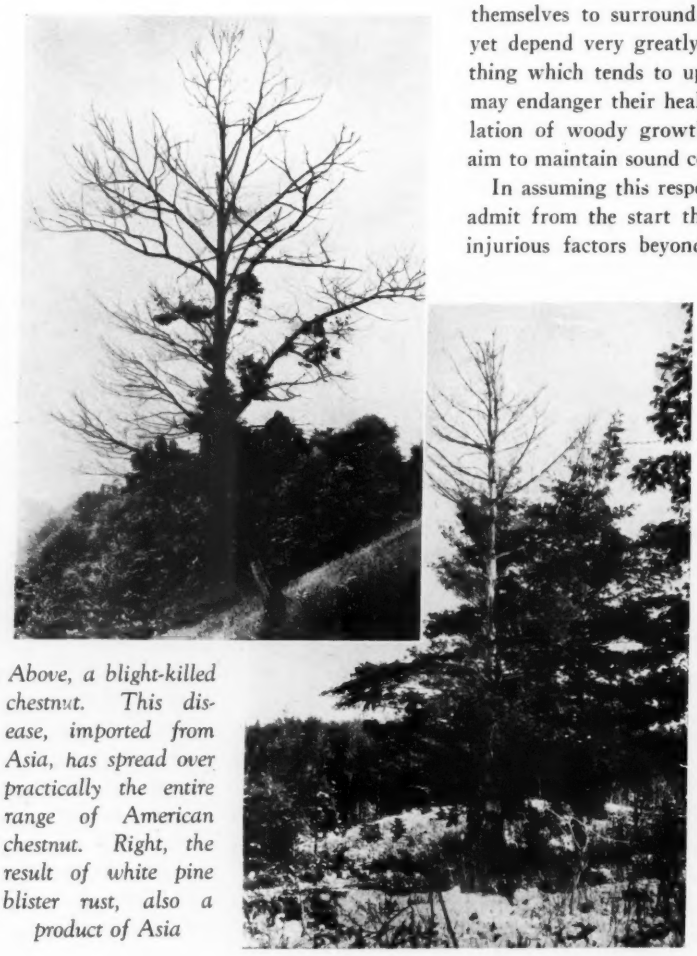
From the point of view of the forest pathologist, mistletoe departs from its romantic place as a Christmas decoration, and is recognized in some of the western areas as a forest enemy comparable only to fire. The mistletoes belong to the group of higher plants having roots, stems, green foliage and flowers, but as a result of their parasitic life they have scarcely any root system, depending for food and moisture upon their host, which they gradually kill. They grow upon broad leafed trees as well as pines and are common over all the southern forests, from east to west. They are particularly destructive among the pines. "Witches' brooms" in pines are often caused by mistletoe.

Fortunately the death of the host tree also causes the death of the parasitic mistletoe. This indicates that cutting of mistletoe infected trees may prove a practicable method of control. Trees along highways and on private properties may be helped by pruning the infected limbs.

Leaf and twig blights caused by different fungi result in injury to several broad leaved trees. Infection is usually indicated by a blotch on the leaf running along the principal veins. The sycamore shows the disease by dead and dying leaves and twig tips early in the spring, when the tree buds. A badly infected tree looks as if it had been scorched. In wet weather the undersides of the leaves will be found covered with cream-colored spots about the size of a pinhead. These contain spores. When the leaves of the tree fall, additional spores develop, maturing in the spring. It is not known which set of spores cause the infection of new leaves. Usually the tree is able to put out an entire new crop of leaves late in the summer, but repeated defoliations stunt it and sometimes kill it.

With a little care, infected trees can be cured and saved. All the leaves should be raked up from beneath the tree and all dead or cankered twigs should be pruned. Leaves and twigs alike should be burned. The control efforts will be more effective if the tree is sprayed with Bordeaux mixture in the spring before the buds burst and again about a week later. A rainy season will encourage the development of spores, so a third and fourth application should be made at intervals of two weeks. The foliage should be completely drenched. This treatment will apply to many other leaf diseases on broad leafed trees.

The diseases considered in this article have been those of leaves and bark, but no less important are those that penetrate the trunk and those that attack the roots. Shelf-like fruiting bodies on tree trunks, and "toadstools" at the base of trees are often evidence of wood destroying mycelia at work beneath the bark. They are the cause of what the lumberman often calls "heart rot" and "red rot" in sawlogs. Once they attack the trees little can be done to control them, so the best way is to keep the trees in the woods growing as naturally and healthily as possible. Often fire is the forerunner of these fungus attacks. Had the tree been able to stand unharmed, there would have been no opening in the bark for the fungus spore to enter. Moreover, the burning of the soil cover may reduce the capacity of the tree to resist attacks of these parasitic fungi.



Above, a blight-killed chestnut. This disease, imported from Asia, has spread over practically the entire range of American chestnut. Right, the result of white pine blister rust, also a product of Asia

So we have another argument against woods burning. Even light fires kill some growing tissues. Fire damage becomes apparent during succeeding years with annually recurring shelf fungi on the lower portions of the tree trunks. This is particularly true in stands of hardwood trees, for occasionally resinous cone-bearing trees heal over their fire wounds without the entrance of wood-destroying fungi.

Among the numerous fungi which attack the trunk and roots of trees it is often difficult to distinguish between those which attack the living trees and those that follow after and attack the tree after it is dead. Each of them destroys the wood and the final results are much the same. Those that grow only on dead wood may be of great commercial importance in relation to the lumber industry, but only the former or truly parasitic fungi have we attempted to consider in this article.

To control any of these diseases the forester or property owner must keep continually on the lookout for signs of disease or abnormality in any of the trees. He must always bear in mind the interdependence and communal nature of the forest. The trees breathe, assimilate food, grow, adapt themselves to surroundings, struggle for life and yet depend very greatly upon one another. Anything which tends to upset the natural conditions may endanger their health and retard the accumulation of woody growth. Forest hygiene should aim to maintain sound conditions within the forest.

In assuming this responsibility the forester must admit from the start that there are a number of injurious factors beyond control. These include lightning, drought, and floods. But the one which carries the greatest possibilities for encouraging disease is too often the one most neglected. This is fire. Although a surface fire may not destroy the trees, and a superficial examination may disclose scarcely any damage, nearly always openings have been made which offer easy entrance to wood destroying fungi and to insects. In such a discussion as this too much emphasis can scarcely be placed upon the need for keeping out fire, and thereby avoiding the opportunity for many destructive fungi to get started. This is especially desirable under forest conditions for it is usually impractical to follow the minor fire injuries with any general treatment. Prevention rather than cure must be the rule.

The field of forest tree diseases is still so new that most of the information must be gleaned from government bulletins, scientific papers and text books. Several government bulletins describe such diseases as white pine blister rust, chestnut blight, damping off in the forest nurseries, and western yellow pine mistletoe. A very satisfactory book is Dr. W. H. Rankin's "Manual of Tree Diseases." This includes a brief description of most of the common diseases and discusses the methods of control.

EDITORIAL

Out Where Water Burns

"THE real conservation problem of the West is the conservation of water," repeated Dr. Wilbur, Secretary of the Interior, upon his return to Washington last month after a summer spent in studying conditions in the West. "Plant life demands water," continued Dr. Wilbur. "We must have plants suitable for our own uses or we can have no civilization. From Nebraska west, water and water alone is the key to our future. We need the mountains and the hills and a great protected back country, or we cannot have sufficient water for our valleys. We must replace homestead-thinking with watershed-thinking, since watersheds are primary to Western homes. We can no longer afford to think only in terms of immediate uses and selfish interests. There must be a great Western strategy for the protection of our watersheds and the plant life on them, however undesirable and unimportant some of it may seem to be."

Theoretically, the "great protected back country" to which the Secretary refers and from which the West receives the bulk of its water is protected by state and national forests and parks. Actually, it is not. In the face of the fire season just closed no one can claim that water conservation in the West is adequately provided for. Present reports, incomplete though they are, indicate that close to two million acres of state, federal, and private lands in the Western mountains were burned over during the summer. Every acre, of course, did not contain timber, but it did bear green, living plant life vital to the conservation of water. When several thousand forest fires during any summer of bad fire weather can drop a pall of smoke over the West and rob its choicest watersheds of two million acres of plant growth, water conservation comes close to being a tragedy of national proportions.

The past summer was an abnormal fire season. It was one of those summers that really test the forest fire organizations of the state and federal governments. Both agencies were found lacking. It was to be expected. Everyone familiar with the facts knows that until the National Congress and the state legislatures provide their forest agencies with funds adequate for the fire prevention task, there can be no real conservation of water, soil, and forests—the trinity of life conservation in the West. During the past quarter of a century this fact has been burned home by one bad fire year after another. It was burned home in 1910, again in 1919, again in 1926, and again in 1929. Still Congress and the state legislatures continue to play penny-ante with Demon Fire. And another bad fire year comes on apace to steal another two million acres of watershed cover!

"These states of the West," says Dr. Wilbur, "are water-conscious." One is forced to wonder if the Western people are as water-conscious as the new Secretary of the Interior believes. If they are, why do they submit to their statesmen playing poker with the worst enemy of their water supply. Why do they not rise up and in a water-conscious voice that will shake state and national capitols from the Golden Gate to the mouth of the Potomac, demand that Congress and their own state legislatures provide fire protection for their watersheds that really protects?

A Newspaper Goes Forestry

The *Detriot News,* one of the great daily newspapers, has offered the people of Michigan a permanent reforestation plan for State-owned lands in need of planting. If the public rises to the opportunity, the paper will have rendered a large public service in the way of bringing back to productivity Michigan's 10,000,000 acres of deforested land. According to the *News,* Michigan now owns 1,390,000 acres of tax-reverted land, and 9,000,000 acres are reverting to the State at the rate of 250,000 acres a year because of nonpayment of taxes. The State is financially able to plant only 15,000 acres a year, and it is to supplement this with private or memorial plantings that the *News* has devised its unique plan.

Without any more trouble than the signing of a check, any individual or group may cause to be planted at a cost of $2.50 an acre, forty or more acres of cutover land which has reverted to the State because of nonpayment of taxes. This is from $3 to $5 less than it costs the State or industry to reforest. These areas will become permanent memorials to the individuals or groups named by the donors and will remain always under protection and proper administration by the State. Trees cut down or destroyed by fire, or insects, will be replaced by the State without cost to the donor.

There is cleverness in the idea of making it so easy for citizens to reforest and at a cost cheaper than the State or private industry. Yet the plan is simple. The State owns

the land and grows the young seedling trees; the press, through its link with the public, sells the idea of memorial planting. The public pays only for the labor cost of planting a memorial that will live always.

Behind this plan stands an ideal, an acknowledgment that if a community is to thrive permanently and become more firmly anchored to prosperity with each successive year, the scientific management of its forest lands must be provided for. That the press should lead the way with its powerful influence is an assertion of public-spiritedness of the first order. The *Detroit News* is to be commended highly for its initiative and foresightedness. That the public will respond to its leadership in such an admirable and constructive program is already indicated. During the first week of the campaign enough funds were received to reforest nearly 2,000 acres, one-eighth of the acreage planted yearly by the State.

Range or Watershed

Following a conference with the President on September 26, Congressman Burton L. French, of Idaho, told newspaper men that he is opposed to President Hoover's suggestion that the public lands of the United States be turned over to the states. Mr. French believes the greatest value of the public domain lies in its influence upon the water supply of the West, and he would have the federal government adopt at once an affirmative policy looking to the protection and up-building of the public domain as an integral part of our great western watershed.

To that end, Mr. French has introduced a bill in Congress (H. R. 4187), calling for a permanent national policy in the protection and administration of the public domain. Under the bill it would be the policy of the federal government "to protect the public domain from deterioration through erosion, to foster its highest use as a natural watershed for the conservation of water and as a deterrent to floods, to encourage the growth of timber and forage plants, and to stabilize the livestock industry as it depends upon the public range."

In his letter to the governors' conference at Salt Lake last summer, President Hoover expressed his belief that grazing is the most important value attached to the surface administration of the public lands, and he implied that the federal government is incapable of adequate administration because grazing is so largely a matter of local understanding. If the utilization of forage were all that is involved in the grazing question as it relates to the public domain, the President might be right, but if, as Representative French contends, water influence is the chief value of the lands concerned, then grazing upon them becomes a question of biological research and scientific regulation so as to prevent soil erosion and make the lands serve their highest purposes as watershed areas. In solving the grazing problem on the National Forests in the West, it has not been the local stockmen but rather the scientific investigator who has worked out the proper grazing methods from the standpoint of tree growth, forage production, soil erosion, and water run-off.

Other bills seeking to establish a federal policy for the public domain have been introduced in past sessions of Congress, but they have failed to arouse any large degree of interest either among members of Congress or the departments of government; neither has the West shown any united interest in seeing the public domain saved from gradual destruction by unregulated grazing, uncontrolled fires, and soil erosion. Even though it meets the fate of past measures, Representative French's bill, introduced at this time, will serve a timely purpose in calling attention to the watershed phase of the public land question.

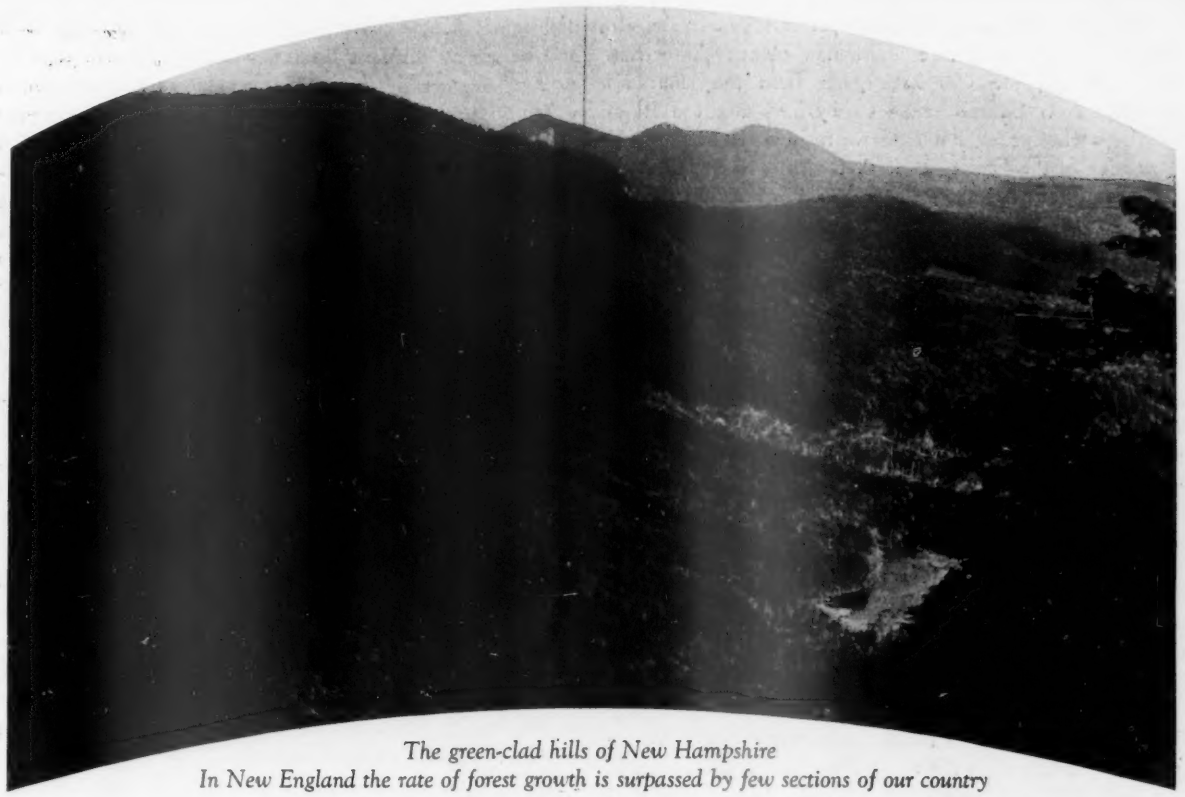
Certified Christmas Trees

A novel plan for doing away with the reckless and destructive cutting of Christmas trees has been developed by the city of Denver. The plan is working so successfully that it has been extended to other sections of Colorado and gives promise of state-wide reform in the harvesting of Christmas trees. The plan is the result of intensive efforts on the part of the Denver Chamber of Commerce, the local Forest Service, and various cooperating civic organizations interested in stopping the unrestricted cutting of Christmas trees and boughs from the mountain slopes around Denver.

After trying various schemes, these agencies hit upon the idea of certified Christmas trees. The city of Denver requires about thirty-five thousand trees and three hundred tons of evergreen boughs each year, and requirements of other Colorado towns are in proportion. There is, however, a strong sentiment throughout the towns and cities of the state against despoiling the forests by reckless and wasteful methods of cutting. Capitalizing on this sentiment, the Denver agencies conducted a campaign to have all purchasers of Christmas trees demand certified trees. Certification was handled by the State Forester and constituted a tag attached to the tree certifying that it had been cut under methods which improved the forest. For trees cut on the National Forests, the Forest Service used a tag reading as follows:

"This tree brings a Christmas message from the great outdoors. Its cutting was not destructive but gave needed room for neighboring trees to grow faster and better. It was cut under the supervision of the U. S. Forest Service from a crowded stand on the Pike National Forest."

This certification is non-compulsory upon the Christmas tree merchants, but with a larger and larger number of people demanding certified trees each year, the merchants are demanding that their trees be cut under approved methods and bear the state certification. This strikes back to the source of all the trouble—to the man who does the reckless and wasteful cutting in the woods. It would be difficult to find a better illustration of how the public can reform the Christmas tree trade. A national demand for certified trees would cure the Christmas tree evil over night. It is is to be hoped other states will take up Colorado's plan.



The green-clad hills of New Hampshire
In New England the rate of forest growth is surpassed by few sections of our country

A New England Forest Policy

By Robert Perkins Bass
Former Governor of New Hampshire

THE first objective of a forest policy for New England is the production of a continuous, dependable supply of the higher grades of timber of such species as are most profitable to industrial production. An important corollary to such a forest policy involves the best use of such a timber supply to promote the agricultural and the industrial prosperity of this region. Before discussing the forest problems themselves, I want to indicate the peculiar importance that this subject holds in its relation to some of the more difficult economic and social problems with which we are today contending.

The various activities of the New England Council have clearly demonstrated and keenly stressed the necessity for certain readjustments of New England's industries. The absence of mineral products, and the limitations which confront our agriculture, create a serious handicap for New England industries in competition with other sections of the country more favorably situated as to raw materials. The increased cost of transportation has multiplied the disadvantages under which we labor to such an extent as seriously to threaten the survival of some of our important industries.

The two chief natural resources available to New England are its water power and its timber. Unless we develop and conserve these we cannot hope to hold that high place in the life of the nation which we have heretofore occupied. Our intelligent population, our ample supply of skilled labor, and of capital directed by wise and resourceful management, will go far toward overcoming existing obstacles, but we shall always be struggling against heavy and needless disadvantages unless we make the best use of such natural resources as are available to New England. These two major resources, timber and water, have a definite relation to each other. The presence of the forest tends to regulate and equalize the stream flow.

The presence of an abundant supply of timber is a factor favorable to many industries. It is well recognized that industry tends to seek the source of supply for raw materials. This is particularly true of such bulky articles as forest products. Note the movement of the paper and pulp industry during the last twenty years. Prior to 1908 it is reported that $29,000,000 were invested in the pulp and paper industry in northern New England. With the shortage of spruce

on this side of the border the new operators, and several old ones, went to Canada to establish new plants. Since that date some $200,000,000 have gone from this side into Canada. New England could hardly have absorbed all of these new enterprises, but have we maintained our natural proportion of this business? Is that which remains to us on a permanent basis or must it too ultimately find success elsewhere? Have we achieved that growth and development in other woodworking industries which is warranted by the proportion of our area now given over to some form of tree growth? Do forest products today contribute as they should to the prosperity of agriculture, and to the dwindling population of our rural towns? These are questions directly related to a forest policy, which we can no longer afford to disregard.

It is vitally necessary to our welfare that these analyses should be made, and above all that we should act upon our conclusions. It concerns not only New England agriculture but her industrial development and prosperity. At present we have no adequate forest policy. In view of the depletion of our forests, can we as business men afford longer to neglect one of the fundamental bases of our industrial life? I am impressed with the fact that we are here confronted with a situation which demands action, and not with a theory which requires perfection.

The extent and relative importance of this question to New England becomes evident when we realize the proportion of our total area now given over to tree growth. In New England as a whole, two-thirds of the land has reverted to woodland. In some of our states the proportion is over seventy per cent. How to make this land count more highly in the industrial upbuilding of the region, is clearly a problem of capital importance. To that aspect of the forestry problem I shall devote a substantial part of this article.

There are several considerations which bear directly upon the industrial utilization of forest products in New England. Some of these factors are favorable to New England, and three are entirely new in our modern life: First, new means of transportation through the substitution of gasoline for steam power, which so greatly increases facilities for deliveries of all kinds. Second, the building of permanent roads, many of which are kept open to motor transportation the year around. Third, the wide distribution of power through the use of electricity.

These three new elements are factors favorable to the establishment of small woodworking industries in rural communities close to the supply of raw materials. A fourth consideration is our proximity to the great markets of the country. New England is fortunate in this respect, for no other wood producing area is more favorably situated for profitable disposal of a bulky product where transportation is so costly.

Tremendous changes are now impending in all forms of timber utilization through the better understanding of the chemistry of wood. Cellulose and lignin are new terms in industry whose importance is not now fully understood or appreciated. They offer the promise of heretofore unknown diversification in wood products. The plastic use of wood cellulose in the manufacture of synthetic boards, and well nigh indestructible tubes; the production of silken garments and of a new form of leather, which may prove superior to cowhide, are a few of the miraculous transformations which today take place in New England industries where trees are turned to a constantly broader and more varied use in our civilization. These products mark achievements already accomplished by industrial research, and its further application to forest products offers a field of infinite promise for the future. We need research for the elimination of waste which in the past has been so extravagant. Our system of handling timber has been wasteful in the extreme. Destructive lumbering should cease. Logging operations should be carried on with a view to future growth.

We need research for the development of new uses for wood in its various forms. The smaller woodworking industries can ill afford to carry on research upon their own initiative. For instance, the wooden box industry has been hard hit by the introduction and wide use of substitutes. We have had many small box factories scattered throughout New England. Some of them have failed, others have dragged on, operating at cost or at an actual loss. This situation has caused a shrinkage of many millions of dollars in the value of all box board timber throughout New England. Adequate research will ultimately find other uses for this grade of pine lumber but the small box board manufacturers certainly can not afford to institute such research.

Above all we need systematic research to find profitable uses for the great quantity of low grade timber and weed trees with which our woodlands are now encumbered. This would not merely increase the profit from our timber lands, but it would create new industries on a substantial scale, and encourage selective cutting so much needed to raise the quality of the remaining saw timber. Such intensive cultivation of the forest crop is not commercially possible until we have a market for the weed tree or by-product of timber growth.

In the last few years we have heard a great deal about New England's lack of raw materials for her industries. What then is our present situation in respect to the most important raw material which we can produce, and what are we doing to stimulate and foster its supply for the future? The first elements essential to an adequate timber supply are suitable soil and climate. These we have in abundance. The rate of forest growth in New England is surpassed in few sections of our country. With us such species as white pine, spruce, white ash, red and white oak, rock maple and white birch are abundant and rapid in growth.

With these natural advantages, what have we done to secure an adequate forest crop in perpetuity sufficient to serve New England industry? The peak of the timber production in New England came in 1907 and since that time the annual cut has shrunk twenty-five per cent, yet the area covered by forest growth is probably greater today than it was twenty years ago. These facts point conclusively to a lack of intelligent management and of a far-sighted forest policy.

In my own state of New Hampshire, large quantities of building material come from the Pacific Coast through the Panama Canal. The ocean freight rate is $18 a thousand

feet, and in addition we pay the cost of handling at both ends. We pay additional freight from our own seacoast to inland points. We lose the employment benefit and wages paid in the production and preparation of this timber.

In a study made for the New Hampshire Branch of the New England Council and published by the New Hampshire Forestry Commission will be found the following:

"For the year 1923 the total freight cost for transportation of 163,000,000 feet of lumber and 278,000 cords of pulp wood shipped into New Hampshire, not including the local freight charges within the state, was $2,282,665. A saving annually in freight of $20 per thousand from the West and from $8.05 to $9.25 from the South would be possible if our own forests could supply the grades of lumber in demand."

These facts apply with even greater significance to Massachusetts and Connecticut, due to their larger population and greater demand. It is probable therefore that New England pays not less than $12,000,000 annually as its freight bill upon imported lumber. A large part of this can be saved if we bestir ourselves sufficiently to grow this timber at home.

New Hampshire produces only about forty-seven per cent of the timber which it consumes, while the importations for all of New England are in excess of fifty per cent of its production. In view of these facts it is indeed startling to learn that we have in New England between 8,000,000 and 10,000,000 acres of woodland which is not today producing trees of any commercial value. This can be classed as waste land, unprofitable and unproductive.

What can we do to remedy this situation? It takes at least fifty years to grow trees for commercial use, consequently we need a well balanced plan of action, which will be stable and permanent. In New England the greater portion of our timber supply must come from privately owned forest land. It is evident therefore that any policy to be effective in promoting increased forest growth depends primarily upon conditions which permit the raising of timber to maturity at a profit. Such conditions do not now prevail in many parts of New England. This is typified by the antiquated methods of taxing growing timber. So long as the annual tax approximately equals the value of the annual growth no amount of skillful management will avail to make investment in growing timber profitable.

To bring waste land into production requires capital investment. To foster the growth of the higher grades and better species of trees so necessary to our industrial needs calls for the investment of money over long periods of time. The practice of taxing forests annually at their full value has, on the contrary, led to cutting timber before it is mature and has discouraged any expenditure for reforestation or for improvement in the quality of existing young growth. A uniform method of taxing timber throughout New England would facilitate its adoption in many states, and would attract capital much needed in the development and manufacture of our chief natural resources.

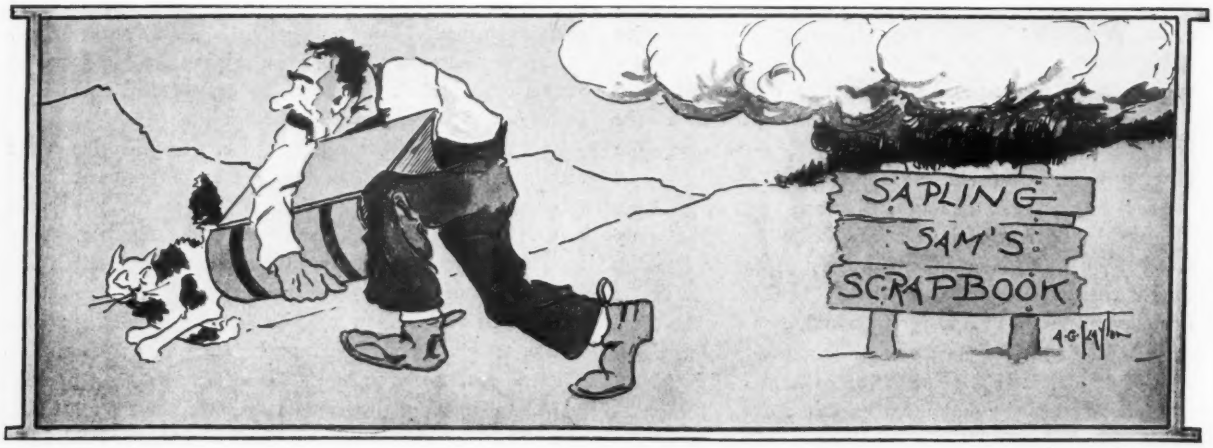
Still more effective forest fire protection will give added stability to the business of raising trees. It is essential to safeguard the farmer's woodlot as well as the big timber areas. Effective fire protection will remove the most serious hazard to any form of forest investment, consequently it will help attract new money to that enterprise. We do not need more forest area in New England but we are sorely in want of a better quality of forest products, and more of them. To that end cooperation in forest management between the state, the federal government and private land owners is highly beneficial. Public forests are a direct aid in this respect in many practical ways. They offer demonstrations to the private owner of what can be done, and how best to do it.

INDIAN SUMMER

A dusty, thirsty, endless road,
The day's light wearing dun,
And lo! one gaunt pine crucified
Against a sullen sun.

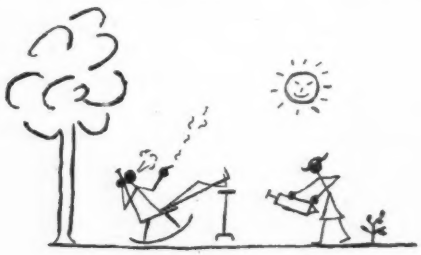
—Marie W. McConnel.

We already have a substantial area of federally owned woodland in the White Mountains. It is desirable from the point of view of stream flow protection, forest production and recreational resources that the area of the federal reservation in northern New England should ultimately be increased to one million acres. States can profitably afford to acquire and maintain small demonstration areas, scattered over the respective states, to serve as examples of the most profitable treatment for different species growing in various types of soil, climate and altitude. Town forests have proved beneficial and most profitable in many European countries. There is no reason why New England towns cannot benefit by the valuable experience of the older communities. National and state governments can bring into public ownership and wise management a minimum of our forest area but the big problem in increasing our forest resources rests with the private land owner. New England as a whole has perhaps 25,000,000 acres of forest land, and more than 20,000,000 acres is likely always to rest in private ownership. We need, therefore, to institute a public policy which will permit and encourage the profitable, intelligent raising of trees to an age and of a quality which are necessary for New England's wood using industries. Any New England forest policy must provide for equitable taxation, more effective fire protection, favorable land credits, constant public education, frequent demonstration areas, extension work to inform and guide small land owners, and state forest nurseries. Most important of all, however, is the creation of a public policy which will enable private owners to grow a crop of trees to maturity at a reasonable profit, and research which will develop increasing uses for the different grades and kinds of our forest products.



New Styles for Birds

The "scarlet indigo bird" was listed by a newspaper as one of the 46 species observed on "Bird Day" at the estate of E. Parmalee Prentice in the Berkshire Hills, according to *American Game.* The latter publication declares that this species is rare, new, and missing from the American Ornithologists' Union check list.



True to His Code

Hostess: (To precious young man) The others are off to tennis and golf. I understand you don't care for games so will you help me spray aphis?

P. Y. M.: Sorry I don't shoot.—*Punch.*

And the Governor Welcomed Him

Headline in Michigan paper:

BULL IS SHIPPED
IN AIRPLANE FROM
CHICAGO TO TEXAS

Of course, you remember what the cow did a long time ago concerning the moon, but then the gentlemen are progressing—give 'em time, give 'em time.

Then, too, there's that suggestion by *Judge* when it heard about abolishing the eagle as the American standard. "How," it says, "about substituting the bull."

Please Itemize All Accounts

One of the District Foresters in Pennsylvania, according to the *Service Letter,* returned some laboriously corrected bills to the office of accounts. Itemization, he thought, might be worked to death, and as an example he enclosed the following copy of an artist's bill for retouching an old church painting:

Adjusting the Stars	$7.12
Brightening Flames of Hell	.60
Cleaning Moon	.10
Correcting Ten Commandments	$7.10
Decorating Noah's Ark	6.50
Embellishing Pilate	3.02
Enlarging Goliath's Head	2.03
Extending Saul's Leg	2.05
Mending Shirt of Prodigal Son	.35
Painting Silver Dollar on Poor Box	.80
Putting Earrings in Sarah's Ears	30.00
Putting a New Tail on the Devil	1.50
New Tail on St. Peter's Rooster	4.18
Rebordering Robes of Herod	1.13
Removing Soot from Vesuvius	3.12
Restoring Lost Souls	25.00
Renewing Heaven	1.00
Taking Spots off Tobias	1.00
Washing Feet of High Priests	3.10
	$100.00

The bill was duly audited, found correct and paid.

She Was Interested in the Weather

In the *California District News Letter,* Ranger Myers of the Trinity National Forest contributes thus to science under the heading, "Annual Disturbances (or Miscellaneous Phenomena):"

"As usual a cow or some prehistoric monster violated the trespass regulations of the Trinity by upsetting our instrument shelter, causing severe shock to the plural thermometers. Our fingerprint expert decided that it was a hoofed animal. Moral: Anchor all your boats as well as tangible improvements before a flood or the return of the dinosaur."

The Thrill of the Chase

The Sod Surgeon of *The Fertilizer Review* doesn't say who told this one but that hardly matters:

"There's one section down in my State where the hookworm is so bad that one day I saw a hound dog chasing a rabbit—and both of them were walking."

New York's Great Planting Project

State Begins Task of Reforesting Million Acres of Abandoned Farm Land

By HERBERT F. PRESCOTT

THE State of New York has entered upon one of the most ambitious reforestation programs that has ever been undertaken in this country, having for its object the reclamation of abandoned farm lands and ultimately all of the idle non-agricultural lands in the State.

On October 3, in the town of Scott, Cortland County, where the first planting area of 530 acres has been established under the provisions of the Hewitt law, initial plantings were made by men prominently identified with the forestry movement. Nelson C. Brown, Acting Dean of the State College of Forestry, at Syracuse University, and as the governor's representative, planted the first tree. Other trees were planted by Alexander Macdonald, Conservation Commissioner of New York State; State Senator Charles J. Hewitt, Chairman of the Reforestation Commission and author of the law under which the new forests are to be planted; and George D. Pratt, President of The American Forestry Association. After the ceremony, regular planting crews took up the task of setting out the 470,000 red pine and Norway spruce required for this first forest.

They planted the first trees. Left to right, Nelson C. Brown, Senator Charles J. Hewitt, Commissioner Alexander Macdonald, and George D. Pratt

The Hewitt law authorizes the State Conservation Department to acquire and plant abandoned farm lands, outside of the forest preserve counties, in areas of not less than 500 acres. There are at least a million acres of such land in New York that can be bought in blocks of 500 acres or more at a cost of less than $10 an acre. In the six months that have elapsed since the law was enacted, the Conservation Department has selected over 6,000 acres at an average cost of $3.20 an acre, and will plant them at a cost of about $7 an acre. In 1880, there were approximately 23,800,000 acres of land in cultivation within the State, or nearly 4,500,000 acres more than at the present time. Of this amount, about 2,500,000 acres have been put to other uses, such as railroads, canals, water supplies, residential purposes, or acquired by the State for park and other uses. An area of 2,000,000 acres, once under intensive cultivation, is at present lying absolutely idle and unproductive. The Conservation Department regards certain conditions as essential to the purchase of these reforestation areas. Not less than 500 contiguous acres must be acquired in any one unit, and it is considered highly desirable that the initial 500-acre purchase be located adjacent to other areas of similar land so that eventually contiguous lands may be acquired to increase the unit to 1,000 acres or more. Five years after the adoption of the constitutional provision, in 1895, that the forest reserve should be kept as wild forest land, the State began the reforestation of denuded areas in these preserves. Eight years later the Merritt law was enacted which authorized the State to supply trees to individuals at a cost not to exceed the cost of production. Under this law the scope of the reforesting movement was broadened greatly and 25,870 forest plantations have been made, with a total of nearly 200,000,000 trees. City and village watersheds have been planted, industrial forests have been set out to supply raw material for wood using industries, many large plantations have been made by sportsmen's organizations to furnish cover for game, and millions of trees have been planted by farmers and private landowners to make profitable use of land that was non-productive.

Department of Science Education

Conducted by ELLIS C. PERSING

Natural Science Department, School of Education, Western Reserve University

How Teachers May Use Current Articles in This Magazine to Supplement Nature and Science-Study Textbooks Will Be Outlined in This Column Each Month by Professor Persing

THE suggestions for using the articles in this magazine will be given in a form that can be used directly by students and teachers in the upper elementary grades, the Junior High School and Senior High School. It is not our plan to displace textbooks in any field of subject matter but merely to suggest supplementary reading and visual materials which will enrich the present course and relate it to the experiences of the pupils.

Elementary School

Wild Plants—"Bittersweet" by P. L. Ricker (see page 697 of this issue).

Perhaps you have found Bittersweet and gathered some of the beautiful fruits for your school or home. Here are interesting facts about this plant. In connection with your study of conservation you will want to know the problems of protecting some of our wild plants. Can you answer these questions about Bittersweet?

1. Where does Bittersweet grow?
2. Should people collect the fruit of this plant?
3. What rule should we follow in collecting wild plants?

Tree Study in Schools—"Forestry In Los Angeles Schools" by Virginia June (see page 701 this issue).

Perhaps you would like to know how pupils in Los Angeles schools learned about trees and conservation of the forests. Read the article and try to answer these questions.

(1) Why were the children ready for forestry instruction?

(2) How was the "treasure" seed obtained?

(3) What use was made of it?

(4) How did the children learn about the effects of fire in the mountains?

The lure of the out-of-doors will be too great for some people during the autumn months. Those who go to the field and woods will be repaid for the time and energy expended.

Explore your region for the nut trees. If the squirrels have not taken them all, you will enjoy searching among the leaves for the nuts.

You will be thrilled to find the witch hazel in blossom on a cold autumn day. Frequently you will see the delicate flowers with the leaves, but later only the flowers on the bare twigs are to be seen.

Junior High School

Birds—"Death Hurdles of the Sky" by William T. Cox (see page 687 this issue).

In connection with the study of bird migration you will find this article helpful. Perhaps you have often wondered how many birds are killed by the millions of miles of overhead wires? Can you answer these questions?

(1) What are the death hurdles of the sky?

(2) Tell the class some instances that show what the casualty list must be.

(3) Why do bobwhites seem to be immune from death by wire?

The Wood Lot—"Forest People" by R. F. Wilcox (see page 698 this issue).

Perhaps you have wanted to own a wood lot at some time and enjoy the growing of forest trees. But does it pay to wait for trees to grow? Read this article and learn what Mr. Fensel sold from his lot and what it is worth today.

Hunting and Fishing Preserves—"Reelfoot Lake" by Marshall Morgan (see page 681 this issue).

When you are investigating the topic of game preserves you should read about the noted Reelfoot country. Here is a fascinating story of how a lake was formed and how it is being used today for the recreation of the people.

1. How can any good come out of an earthquake?
2. Why do camping parties journey to Reelfoot?
3. How are fish caught in this lake?

Senior High School

Forestry—"A New England Forest Policy" by Robert P. Bass (see page 711).

In connection with the study of forestry you will find helpful suggestions for activities in this field.

(1) What is the first objective of a forest policy?

(2) What are the two chief natural resources of New England?

Wild Life—Elk—"Summering with the Elk" by Olaus J. Murie (see page 694 this issue).

Read this in connection with your study of wild animals.

Conservation—"A University of the Wilderness" by Ernest C. Oberholtzer (see page 689 this issue).

This is the third article describing the present and future of two public reservations that join to make an international playground.

1. What noble animal did President Roosevelt help protect when he established the beginnings of the Superior National Forest?
2. Outline the situation that threatens to destroy one of the major purposes of the reservation.
3. Describe the program of the Quetico-Superior Council.

Forest Fires—"Ninety-Nine Red Days" by John D. Guthrie, Wallace Hutchinson and Howard R. Flint (see page 675 this issue).

Those who think that the glory of combat is possible only in war should read this and get a new conception of life as it confronts the forester and lumberman when fires rage in the forest.

1. Describe the conditions that tend to bring about and accompany extreme fire danger in the forest.
2. What are the chief losses caused by forest fires?
3. How can the majority of these disastrous fires be avoided?

Trees—"Knowing and Treating Tree Diseases" by G. H. Collingwood (see page 705 this issue).

This is the sixth of a series of articles about trees. If you have not read the other five you will find them in the back issues of this periodical. Read the article and prepare a report for your class.

Lumber Industry Announces a Forestry Program

America's Lumber Mills Employ 600,000 Men

"THE lumber industry has the greatest stake of all in the forest future of the country, since it owns practically half the forest acreage and is intimately concerned with the other half, whether public or private, as a means of perpetuating the sources of its livelihood.

"Therefore the National Lumber Manufacturers Association logically should take the initiative in formulation of policies affecting the care and management alike of public forests and of private timberlands.

"The lumber industry has an enviable record of accomplishment in the development of manufacturing processes and logging engineering methods. It is gaining an equally enviable record through its national and regional lumber-trade extension campaigns and otherwise for progress in self-regulation and toward modernization of the merchandising and distribution of its products.

"We must soon look for an increasing proportion of our timber supplies hereafter to man-grown forests. There is sound reason that the lumber industry should lead rather than follow in the development of commercial forestry. That it should do so is in the interest of economic progress and of national welfare.

"In order, therefore, is a thought-out, definite, constructive, aggressive forestry program for the stimulation and guidance of forest-land owners and for the education and inspiration of their wood-loving fellow citizens."—*From the introduction to the Statement of the Forestry Policy adopted by the Board of Directors of the National Lumber Manufacturers Association.*

Forestry Program of the National Lumber Manufacturers Association Summarized

1. Intensive campaign to encourage every commercial forest owner to study carefully the economic timber-growing possibilities of his properties.

2. Encouragement to forest owners to study the economic advantages of selective logging and sustained yield methods and to apply them wherever practicable.

3. Expert advice to individual forest-land owners and to regional lumber manufacturers' associations to stimulate and direct forest economic studies of individual forest-land properties.

4. Acceleration of cooperative activities under the Clarke-McNary and McSweeney-McNary Federal acts to eliminate methods of oppressive taxation, to extend effective protection against fires, to improve standards of wood utilization and to advance sound economic practice in forest conservation and replacement.

5. Development of plans for stabilization of the lumber industry and the orderly control of production.

6. Coordination of sales of Federal and State Forest timber with the activities of owners of adjacent private forest property.

7. Larger appropriations for the protection of National Forests.

8. Expansion of Federal, State and Municipal forest ownership.

9. Permanent reproductive administration of the Indian Reservation forests.

10. Education of the public to a more intelligent utilization of lumber and other forest products, and encouragement of public and private research in the utilization of logging and sawmill by-products and diversification of wood uses.

(For copy of the full Program, write the National Lumber Manufacturers Association, Transportation Building, Washington, D. C.)

National Lumber Manufacturers Association

WASHINGTON, D. C.

Michigan Paper Launches State-Wide Reforestation Campaign

A permanent reforestation plan for state-owned lands in Michigan, in which public-spirited citizens, organizations and schools may take part, has been launched by the *Detroit News*. The plan is to plant trees on the hundreds of thousands of acres of cut-over land which has reverted to the state largely through tax delinquencies. One week after the campaign was launched, funds enough had been sent to the newspaper to reforest 1,640 acres.

It is stated that there are 1,390,000 acres of this type of idle land that has reverted to the state, and more than 9,000,000 acres in private ownership that are coming back to the state at the rate of 250,000 acres a year, because of nonpayment of taxes. It is also pointed out that the state is financially able to plant only 15,000 acres a year. It is to supplement this program with private gifts that the *News* devised its plan.

Under the plan, any individual or organization will be given an opportunity to plant forty acres or more at the rate of $2.50 an acre. This covers merely the planting labor cost, while the land, trees and other expenses will be borne by the state. These plantings will be made in twelve of the great forest reservations now under state administration, embracing 373,000 acres.

As soon as a planting is completed those who participate will be notified of its exact location. The *News* will erect on the plantation an indestructible metal sign bearing the name of the donor and the size of the acreage planted. The donor also will receive from the conservation authorities of the state a letter stating that the reservation will be forever set aside as a forest reserve subject only to administration by the proper forestry officials. At no time will the land be utilized for any other purpose, nor can it be disposed of under any circumstances. It becomes a permanent reservation, and when it becomes wise or necessary to harvest a timber crop, for each tree cut a new one will be planted. In the event that a forest fire or disease should destroy the tree growth the state will replant the area as soon as it becomes feasible and at no cost to the original donor.

In announcing this plan, the *News* pointed out that it is only through a greatly awakened public interest that Michigan's forests will be restored.

President Hoover to Hear Proposed Forestry Program

PRESIDENT HOOVER will receive representatives of The American Forestry Association and more than twenty national and regional organizations interested in forest conservation October 30, to discuss an adequate financial program that will enable the government to protect more effectively its forest resources and bring them to higher productivity.

Special emphasis will be placed on an adequate program for forest fire protection. The disastrous forest fire season of 1929 has clearly shown, the President will be told, the need for stronger financial support for fire prevention and fire suppression activities. Other federal forestry enterprises which will be discussed include cooperative fire control, forest planting, forest research, and public forest acquisition.

In addition to The American Forestry Association, other organizations include the Izaak Walton League of America; California Development Association; American Engineering Council; General Federation of Women's Clubs; Western Forestry and Conservation Association; American Tree Association; Sierra Club; American Farm Bureau Federation; National Forestry Program Committee; Southern Forestry Conference; Association of State Foresters; National Lumber Manufacturers Association; National Audubon Society; Society of American Foresters; American Game Protective Association; Newsprint Service Bureau; Pine Institute of America; Society for the Protection of New Hampshire Forests; Ecological Society of America; and the Tropical Plant Research Foundation.

Florida to Have Forest Fair

The first Florida Forest Fair will be held at Lake City, Florida, November 13 to 15, inclusive, under the auspices of the Florida Forest Service and the Lake City Chamber of Commerce. According to Harry Lee Baker, State Forester, the fair will be the greatest single event that has ever occurred in the history of conservative land utilization in the state.

Its purpose, says Mr. Baker, is to emphasize the importance of forest lands as industrial assets, to show by interesting exhibits and demonstrations the methods whereby the value of such assets can be increased, and to bring together the latest and best thoughts of the leaders of the forest industries. Exhibits will embrace improved turpentining methods, new uses for southern

pine, and factors affecting rosin grades. Naval stores and lumbering tools and equipment as well as tree planting equipment, will be displayed by various manufacturers. The new exhibit truck of the Florida Forest Service and The American Forestry Association, the only one of its kind in existence in the United States, will be on display for the first time.

Actual demonstrations will be given in the woods in fire lane construction, says Mr. Baker, and an opportunity will be given to study thoroughly the costs of fire line protection in comparison with raking and burning. There will be actual demonstrations in land clearing, forest tree thinning and the planting of forest tree seedlings. Speakers of national prominence will be on the program.

Federal Highway Commission Opposes Public Lands Proposal

According to a letter which Senator Ashurst had read in the Senate on September 30, the Arizona State Highway Commission has voiced disapproval of the proposal of President Hoover to turn the surface rights of the public domain over to the states. The letter which was addressed to Senator Ashurst and signed by M. C. Hankins, secretary of the State Highway Commission reads as follows:

"The President of the United States recently proposed to the governors of the several Western States, at a conference held in Salt Lake City, that the United States convey to the Western States only the surface rights of lands located within each State and owned by the United States, reserving to the United States the mineral rights and other subsurface rights, as well as all forest lands and National Parks.

"In view of the fact that Arizona, in which are located the lands belonging to the United States, is isolated from the Pacific and Atlantic coasts by areas of barren, nonproductive, and nonirrigable lands, through which must be constructed and maintained modern highways, the Arizona State Highway Commission is unalterably opposed to the recommendations of the President of the United States. This recommendation would add additional tax burden upon the people of Arizona.

"In the event such a recommendation is made to Congress we hope that you will do all within your power against any proposed legislation along this line."

Sentiment Growing For Land Economic Survey

Sentiment is growing in favor of a land economic survey as a means of promoting efficient utilization of land, in the opinion of Dr. C. L. Gray, chief of the land economics division of the Bureau of Agricultural Economics. In making such surveys, he stated, the productive possibilities and limitations of a given area are determined and reliable information upon which to determine the best use of the area is made available.

In addition to benefiting the farmer, Dr. Gray believes that such a survey would help arouse interest in public reforestation by furnishing reliable information as to what lands are best suited for this purpose. The economist called attention to the large number of farms now occupied which are essentially incapable of providing the farmer and his family with a reasonable standard of living, roughly estimating that there are about 750,000 such farms east of the Great Plains area.

Emphasizing the need of planting a portion of the five or six million acres of low grade land in trees, Dr. Gray said that reforestation is now retarded by the uncertainty as to what land and how much is incapable for use as farmlands, or not required. Local business interests and land owners hope for their own sake to "get the land settled," he said, regardless of whether the settler can succeed, and, in any event, it is usually beyond the facilities of the individual owner or even his community to discover what uses the land is best suited to.

Florida Pecan Grove For Sale

On Account of Death of Owner

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Thirty States Get $1,600,000 From National Forest Receipts

Announcement has been made by the United States Department of Agriculture that a sum of $1,600,000, more than twenty-five per cent of the gross receipts from National Forests during the fiscal year ended June 30, will be paid to thirty states for roads and schools. The state shares of the receipts represent a Federal payment in lieu of taxes that would be received were the forests privately owned and, according to the Federal statute providing for the apportionment, the forest funds must be used for roads and schools.

Most of the receipts, said Acting Secretary Renick W. Dunlap, of the Department of Agriculture, came from timber sales and grazing. Due to overproduction in the lumber business timber sales were not pushed but, ultimately, the result will be increased revenues and still larger sums for the states. Furthermore the National Forest revenue will be perpetual; the timber represents a permanent asset, handled by "sustained yield," so that when an area is cut over it grows up again in timber. Mr. Dunlap explains that the states do not have to bear a penny of the burden of National Forest protection, administration, or development. During the fiscal year ended June 30, 1928, the Federal Government spent more than $20,000,000 in improving, administering and adding to the National Forests.

State shares for the fiscal year 1929 were as follows:

Alabama, $188.94; Alaska, $20,628.89; Arizona, $133,049.37; Arkansas, $18,908.37; California, $356,606.10; Colorado, $124,715.29; Florida, $7,889.75; Georgia, $3,351.38; Idaho, $156,928.12; Maine, $1,416.10.

Michigan, $1,685.38; Minnesota, $7,125.07; Montana, $65,968.89; Nebraska, $2,396.21; Nevada, $23,130.77; New Hampshire, $19,532.11; New Mexico, $35,718.97; North Carolina, $7,654.80; Oklahoma, $1,142.24; Oregon, $265,025.97; Pennsylvania, $1,012.22; Porto Rico, $62.48; South Carolina, $1,266.88; South Dakota, $42,988.27; Tennessee, $2,980.78; Utah, $51,287.05; Virginia, $9,238.26; Washington, $167,779.28; West Virginia, $1,745.31; Wyoming, $74,459.40.

Wood Waste In North Carolina

Thirty-three thousand carloads of waste wood, the equivalent of 113,000 acres of standing timber, are available annually in North Carolina for the use of wood-using industries, a recently completed survey by the National Committee on Wood Utilization has disclosed.

The survey, the second completed by the committee, was begun a year ago in cooperation with state officials with the view of ascertaining the location, kind and quantity of non-utilized wood at sawmills and woodworking plants. In commenting upon the findings of the survey, Axel H. Oxholm, director of the committee, pointed out that this wood, if converted into lumber, would build a city of frame houses the size of Denver, Colorado.

"When it is considered that such important commodities as pulp and paper and fiber products, charcoal and wood chemicals, lath, excelsior and other materials used in every day life may be made from wood waste," Mr. Oxholm stated, "the wonder is that merchantable standing timber should still be used by industries for such purposes. By an intelligent coordination of their raw material policy, wood-using industries could supply at least a part of their raw material needs from the nation's wood waste pile."

Wood Industries Meeting in Illinois

A national wood industries conference, under the direction of the Rock River Valley Section of the American Society of Mechanical Engineers, was held at Rockford, Illinois, October 16 to 18. Eleven papers were presented dealing with the latest developments in management, glue, machinery, wood bending, end coatings and production. An inspection trip was made to the Forest Products Laboratory, at Madison, Wisconsin.

Principal speakers included Carle M. Bigelow, president of Bigelow, Kent & Williard, Boston, Massachusetts; Thomas D. Perry, manager, New Albany Veneering Company, New Albany, Indiana; G. P. Ekstrom, president, Ekstrom Carlton Company, Rockford, Illinois; and F. L. Browne, J. S. Mathewson, L. V. Teesdale, and T. R. C. Wilson, of the Forest Products Laboratory.

Buys Land for Public Forest

Isaac W. Bernheim, formerly of Louisville, Kentucky, has presented the State with a 13,100 acre tract of burned over and cut over forest land which is to be reforested and maintained as a public recreation park, wild life sanctuary and demonstration area. The tract is located in Bullitt and Nelson Counties and was acquired after an examination of many properties in the State.

An endowment has been provided to maintain the forest in perpetuity and provision has been made for free distribution of trees throughout the State for reforestation purposes. Ronald B. Craig, of the United States Forest Service, has been appointed ranger in charge and a fire protection system is already in operation.

Establishment of the forest represents the largest private movement ever made in Kentucky for checking the depletion of forests and the tract is expected to become a demonstration of the possibilities of constructive forestry. Mr. Bernheim is eighty-four years old. He was born in Baden-Baden, Germany, at the edge of the Black Forest, which has been under forestry management for seven centuries.

Collect Forest Products Data

Data collected at the annual canvass of forest products for 1928, says the Department of Commerce, shows that the production of lumber, lath and shingles in the United States was as follows: Lumber, 34,142,123 thousand feet, board measure, a decrease of one percent as compared with 34,532,420 thousand feet in 1927; lath, 1,903,859 thousand, a decrease of twenty percent as compared with 2,372,333 thousand in 1927; and shingles 5,603,690, a decrease of thirteen percent as compared with 6,443,868 thousand in 1927.

Of forty-six States reporting twenty-eight showed decreases and eighteen increases as compared with the 1927 output. The greatest increase was indicated for Oregon and the greatest decrease for Alabama.

Heads North Carolina Association

F. M. Brown, of Roanoke Rapids, North Carolina, has been named president of the North Carolina Forestry Association, to succeed Ruben B. Robertson, of Asheville, president of the Champion Fibre Company.

At its recent annual meeting at Asheville, the Association voted approval of a bill pending before the state legislature which would authorize the State Department of Conservation and Development to acquire by purchase, gift, exchange or contract, forest lands for the creation of a system of state forests and parks, game refuges and shooting grounds.

Half Million Trees Offered For Planting in Virginia

Chapin Jones, State Forester for Virginia, has announced that about 500,000 forest tree seedlings, comprising ten different species, are available for planting idle lands in the State. These trees may be purchased at a minimum cost, the prices ranging from $3.00 per thousand for loblolly and shortleaf pines to $7.50 for tulip poplar.

Interest in reforestation is increasing rapidly in the State, Mr. Chapin says. The service distributed 375,000 forest tree seedlings last spring as compared with 20,900 the previous spring.

Additional $5,000,000 Sought For Agricultural Research

Thirty-one national farm and industrial organizations, including The American Forestry Association, are represented in an informal association which has petitioned the director of the budget, Col. J. C. Roop, for "adequate appropriations" for research work by the Department of Agriculture. The alliance, headed by Chester H. Gray, of the American Farm Bureau, represented diversified interests ranging from banking, manufacturing, canning, lumber, forestry, tanning and the automobile industry to terminal agencies such as the commission merchants, fruit jobbers, meat packers and grain exchanges.

Mr. Gray's statement pointed out that the alliance of these independent groups on the issue of research indicates that the citizens of the nation as a whole are willing to have sufficient taxes allocated to agricultural research.

"It has been conclusively demonstrated," he said, "that such studies are in the interest of both producers and consumers and greatly contribute to agricultural and national well-being. Two years ago, when this group, which then consisted of only thirteen organizations, informally banded itself together and began to emphasize the need of more funds for agricultural research, it was thought that $10,000,000 additional to the current appropriation might be sufficient for a well-rounded continuing program. Perhaps half of that amount has been obtained. If our preliminary estimate of $10,000,000 remains as a goal, we still need $5,000,000."

Florida High Schools Offer Forestry Course

A course in forestry, arranged in cooperation with the State Forest Service, is to be included in the curriculum of agricultural work offered in Florida high schools, J. F. Williams, supervisor of agricultural education, has announced.

Fifteen lessons are included in the schedule, about one-half dealing with outside work. Special work will be given in the collection of forest tree seeds, raising forest tree seedlings and the establishment of demonstration protection plots to illustrate the possibilities of safeguarding forest lands. Many schools are offering special prizes to boys rating highest in the work and a special prize of a trip to the National Congress of Future Farmers of America, at Kansas City, has been provided for the boy in the state who ranks highest in his forestry classes and field work.

Site for New Park Inspected

Arno B. Cammerer, Associate Director of the National Park Service, has suggested a typical cross section of the Mississippi River from Bellevue, Iowa, to Lake Pepin, near Red Wing, Minnesota, as the most desirable area for the proposed Upper Mississippi National Park.

Under instructions from the Secretary of the Interior, Mr. Cammerer recently joined representatives of the States of Minnesota, Wisconsin, Illinois and Iowa in a brief, informal inspection of portions of the Mississippi River Valley and adjoining bluffs, in the State of Iowa. He expressed the belief that when formal inspection is made of the area, it should cover territory in the adjoining states, since, if such a park is possible there, it should contain a typical cross section of the river as well as many of the bluffs and some of the primitive prairie land adjoining the bluffs on top.

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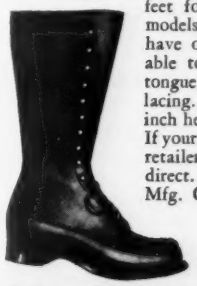

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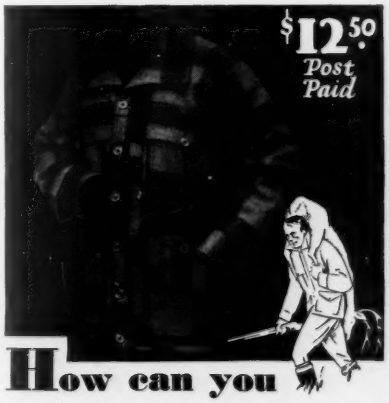

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Dry Lightning Explained

So-called dry lightning, dread of rangers and fire wardens, especially in the southwestern United States, is due to the same causes and occurs in the same manner as any other lightning, according to E. A. Calvert, Senior Meteorologist in charge of the Forecast Division of the Weather Bureau.

A thunderstorm, says Mr. Calvert, is caused by a violent vertical convection of air that contains enough moisture to be condensed into an abundance of raindrops. All thunderstorms are equally wet in and just beneath the cumulo-nimbus clouds where the raindrops form. Under conditions in which the lower air is even moderately humid, the rain forms at such low levels that only a part of the condensed moisture evaporates as it falls toward the earth.

On the other hand, Mr. Calvert declares, in regions where the lower air is extremely dry the water vapor condenses, or the rain forms, so high up that all or nearly all of it evaporates in midair as it falls, and the thunderstorm is a dry one. With no accompanying moisture reaching the ground to wet the burning material, forest fires set by such storms spread rapidly.

Michigan Kiwanians Inspect Huron National Forest

For the second time the Kiwanians of Michigan met on the Huron National Forest to celebrate the continued planting of the Kiwanis Forest which was started last year. One thousand acres were planted in the fall of 1928 through the cooperation of the Forest Service and the Kiwanis Clubs of Michigan. Late in August five hundred members visited East Tawas and inspected the plantations on the Huron National Forest, visiting the Beal Nursery, the public camp grounds, and the last year's Kiwanis planting, the Kanotin Club, of East Tawas, acting as host to the party in cooperation with the Northeastern Michigan Development Bureau. Among the speakers were Judge Edward Black, of Flint; Congressman Roy O. Woodruff, of Bay City; and Associate Forester E. A. Sherman of Washington.

Proposes Federal Control of Public Domain

Representative Burton L. French, of Idaho, has introduced a bill (H. R. 4187) to provide for the control and orderly handling of grazing and forest problems upon the public domain. The bill would empower the Secretary of the Interior to study the public domain with particular reference to the questions of soil erosion, the highest uses to which watersheds may be put and the permanent production of timber and forage plants. It would permit the Secretary of the Interior to issue permits to graze livestock upon the public domain and to collect reasonable fees, half of which shall be paid to the State in which the land is situated, to be used for public schools and for the maintenance of public roads. Timberlands are to be administered after the manner of the lands within the National Forests, and the receipts are to be divided equally with the states.

Although his plan differs from the proposal recently made by President Hoover, Representative French has stated that the President has rendered a distinct service to the people in directing the attention of the country to the havoc that is being wrought to the public domain. He favors administration by the Federal government rather than by the several states for two reasons; first, the constancy of program on the part of the Federal government which is lacking in the states; and, second, because of the fine body of public opinion, the country over, that supports the Federal government in contrast with the sharp demands of local interest through state legislatures and state boards.

Representative Colton of Utah, Chairman of the House Committee on Public Lands, recently stated that this bill will be considered by his Committee at hearings which will probably be called early in December.

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Graves Questions Land Policy

Dean Henry S. Graves of the Yale School of Forestry and former Chief of the United States Forest Service in an interview published in a recent issue of the *New York Times* expressed his opposition to the proposal to transfer *en bloc* the public domain to the States. Dean Graves said:

"Generally speaking, I cannot concur in a policy that will transfer *en bloc* the bulk of the public domain to the States, because I do not believe that the far-reaching and complicated economic and industrial questions concerned will be solved by such action.

"In my opinion, extensive areas of the public domain must remain in federal ownership and be handled as grazing reservations. They have not been taken up by private individuals partly because the present laws do not permit their acquisition in large enough units and partly because they are not of such character that they may be held profitably by private ownership.

"Certainly, the Federal Government should not surrender its control over land now owned by the nation which may vitally affect national interest.

"I hope that the proposed commission will give consideration to these features and to other factors that bear on this complex problem."

St. Lawrence University Establishes Forestry Department

St. Lawrence University at Canton, New York, has established a department of forestry under the leadership of Floyd M. Callward, formerly extension forester in Vermont. The department announces that its main objects are to develop forestry on privately owned lands of northern New York and to present courses in forestry to the students of the University. Special emphasis in the resident courses will be given to northern New York conditions.

Inter-American Conference

An inter-American conference on agricultural, forestry, and animal industry in Washington, D. C., beginning May 12, 1930, is being planned by the Pan-American Union. The committee on inter-American agricultural cooperation composed of the Minister of Colombia, the Minister of Nicaragua and the *Chargé d'Affaires* of Paraguay are developing the program. One of the main purposes of the conference will be to establish contact between modern developments of science and the actual needs of economic production.

West Virginia Group Studies National Forest

The first large-scale informational forestry tour to be conducted in West Virginia was made recently when sixty-eight lumber manufacturers, coal operators, legislators, road officials, and others made a two-day investigation of the Monongahela National Forest. The party was guest of the Forest Service with the cooperation of the West Virginia Game, Fish and Forestry Commission and the Agricultural Extension Division of the West Virginia University. Supervisor Perkins of the Monongahela National Forest was in charge of the party.

Practically the whole of the area within the Monongahela Forest had been cut over and repeatedly burned before it was acquired by the Government. Under organized fire protection, promising stands of hardwood timber are coming back on many areas, and there is some regeneration in the spruce type. Nearly 40,000 acres have been so badly depleted, however, that artificial reforestation will be necessary.

Preservative Treatment of Cross Ties Slumped in 1928

Plants in the United States gave preservation treatment to 70,114,405 cross ties during 1928, less by 4,117,435 than the 74,231,840 ties reported treated in 1927, according to the report of R. K. Helphenstine, Jr., of the United States Forest Service, in cooperation with the American Wood Preservers' Association. As in 1927, oak, yellow pine and Douglas fir ties ranked first, second and third respectively, in 1928, from the standpoint of quantity treated.

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12 to 18 inch seedlings	1.50	12.50
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12 to 18 inch seedlings	1.25	10.00
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Power Commission to Visit Cumberland Falls

Members of the Federal Power Commission are planning to visit Cumberland Falls, in Kentucky, and see for themselves the reputed natural beauty of the waterfall before determining whether or not to turn it over for development as a power project. No date has been fixed for the trip. It was also announced that final disposal of the power application of the Cumberland Falls Hydro-electric Company, an Insull subsidiary, will be delayed until after the inspection trip. T. Coleman DuPont is leading the fight against the development, and has offered to purchase the land surface surrounding the Falls and present it to the state for a permanent park if the power application is rejected.

Attorneys for the power commission have submitted an opinion stating that the commission cannot consider the park possibilities in passing upon the Insull application. The commission so far has refused to accept this opinion and the fact that its members plan the inspection trip is believed an indication it may be given little consideration.

Discuss Problems of Outdoor Leadership

"Leadership in Play and Recreation" was the general theme for the Sixteenth National Recreation Congress held at Louisville, Kentucky, October 14 to 19, inclusive. Problems of leadership for outdoor activities—camping, hiking, nature study—were discussed in several sessions.

National Park Visitors Increase

Visitors to the National Parks in 1929 increased from twenty to thirty-three per cent over 1928, according to Secretary of Interior Ray Lyman Wilbur, who has just completed a tour of the parks.

"Yet the indications are that this travel to National Parks has but just started," he stated. "This system of parks built up in the last decade and a half is proving a national asset of stupendous importance.

"A developing feature in the handling of these Parks is the direction of those who visit them into educational understanding of the plant and animal life and of the geological phenomena which are there so strikingly set out. Museums are appearing in all Parks, and the naturalist rangers who act as guides and lecturers are increasing in number and popularity. This summer all the members of that distinguished committee on education which was appointed by the Department to study the developing of the educational possibilities of the Parks have been working diligently in them. These Parks are thus becoming important educational institutions."

Urges Increased Fire Appropriations

Returning to Washington from a trip which included an inspection of thirteen National Forests in ten western states and Alaska, Representative John W. Summers, of Washington, is strongly convinced that larger appropriations are necessary to enable the Forest Service to more adequately combat destructive fires. Representative Summers is a member of the House Committee on Agricultural Appropriations, of which Representative L. J. Dickinson, of Iowa, is chairman. Other members of the Committee who made the trip include Representative John N. Sandlin, of Louisiana, and James P. Buchanan of Texas.

Representative Summers declared that the big forest problem is the protection of standing forests and young growth from forest fires. He advocated a better system of fire practices and the construction of trails for fire fighters. Greater federal appropriations and expenditures for roads, trails, and firebreaks, he said, will be necessary if the Forest Service is to achieve its goal of having fire fighters reach the scene of the fire within two hours of its outbreak.

"We who have studied the problem on the ground this year," he said, "believe it will be greater economy to spend more money on roads, trails and firebreaks than to roll up the expense of emergency fighting."

Ohio 4-H Forestry Clubs Grow

In one year's time extension workers in Ohio have made "two 4-H club foresters grow where but one grew before." Clubs in twelve counties of the state report 205 new members this year. Seven other counties have such clubs.

The new members, according to the Forest Service of the United States Department of Agriculture, last spring planted 210,000 trees sent to them from the state nurseries at Wooster and Marietta, each member receiving enough two-year seedlings to plant an acre of land. On the farms of Trumbull County alone new forestry club members reforested sixty acres.

Now that planting is off the calendar for this year the clubs are busy with tree identification and with plans for forestry exhibits at county fairs. First-year requirements of a forestry club member include the identification of fifteen native forest trees of commercial importance in his home section.

Southern Pine Seedlings

We offer a few hundred thousand 1-0 seedlings from our De Ridder, La., nursery

Longleaf pine (*Pinus palustris*)
Cuban or Slash pine (*Pinus caribea*)
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Sturdy Stock ∴ Ready January 1, 1930 ∴ Prices on request

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Billboard Law Up for Test in Massachusetts Courts

The Outdoor Advertising Company, of Massachusetts, has brought suit against the State in both Federal and state courts, restraining it from enforcing the law regulating the construction and maintenance of billboards, pending a decision as to its constitutionality. The law, of comparatively recent enactment, requires that a fee shall be paid on billboards, and in other ways restricts this form of advertising.

Progress of the test case is being watched with interest by individuals and organizations throughout the country that are opposed to the defacement of public highways by these blatant and unsightly signs. The decision will undoubtedly constitute an important legal precedent and, if Massachusetts is victor, a long step will have been taken toward the ultimate eradication of the billboard nuisance.

Michigan Establishes Bear and Deer Refuge

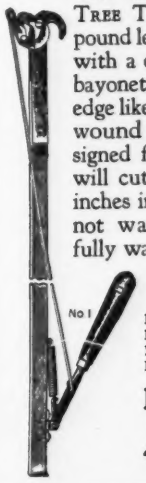
The Michigan Department of Conservation has established a deer and bear refuge in the Pigeon River district of Otsego and Cheboygan Counties. The refuge, surrounded by thousands of acres of public hunting grounds, constitutes what the department believes may be the answer to two questions: how to help increase wild life and still provide good hunting for those who are not members of private clubs.

A block of country nine miles long and six miles wide, adjoining 16,000 acres previously acquired by the State, comprises the area. A game refuge was established five years ago on part of this land, then mostly under private ownership, enabling the deer to stage a comeback. Elk were planted in 1918 and have increased steadily so that they are often seen along the woods roads. Bear also are quite common, while the Pigeon River abounds in fish.

Civic Association Holds Third Traveling Annual Meeting

The third traveling annual meeting of the American Civic Association was held in Illinois October 4. Starting at Springfield, the party held patriotic services at Old Salem Park, where Lincoln kept store and postoffice; visited the forest preserve of the University of Illinois, at Urbana; and inspected the Starved Rock State Park and the Cook County Forest. The trip terminated at Chicago where the regional planning meeting was held jointly with the Chicago Regional Planning Association, the Art Extension Committee, and the Ohio Valley Regional State Park Conference.

"Trim Your Trees Carefully"



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You can plant them after Christmas. Each Guild Tree is GUARANTEED TO LIVE. Any tree which does not flourish will be replaced without cost in the spring.

Mail the order form without delay. You will receive a prompt acknowledgment. Then, at the right time, your trees will arrive fresh and fragrant.

THREE SIZES

Living Christmas Tree

For the center of your holiday celebration. Stands 26 to 36 inches including the depth of the red lacquer container. When you take the tree out of its box it is all ready for use—green, fragrant, living.
A live tree is the most economical Christmas tree you can have.

ONE TREE $3.95
TWO TREES ... $7.50
DOZEN TREES ... $42.50

If you prefer to have a delivery with all charges prepaid please add 50 cents per tree. (West of the Mississippi add $1 per tree.)

Guild Table Tree

Here is a delightfully appealing way to adopt the living Christmas tree idea. A shapely spruce, standing 12 to 15 inches in a colorful metal pot, can be decorated in any number of ways. It is adorable on dinner table, mantelpiece or end table. It will make a valuable evergreen for planting outdoors after it has served its first purpose of giving holiday cheer.

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SIX TREES ... $11.00
ONE DOZEN $20.00

Please add 20 cents per tree for delivery charges.

Guild Greeting Tree

Send them to your friends. A unique alternative to Christmas Cards! Its tiny fragrant branches, its attractive container and the neat way it is packed, express the *extra* thought of the giver. This tree has been brought up with loving care so as to live and grow. It is a charming miniature when delivered (about 6 to 8 inches tall), and with the right care it will grow into a large tree.

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ONE DOZEN ... $10.50
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If you wish trees sent direct to your friends attach list of addresses.

We will send trees direct to your individual friends, if you wish, on the date you specify. And your own card can be enclosed. These Trees are scientifically packed and can be sent by parcels post or express anywhere in the United States. Special decorations and advice for care accompany each tree.

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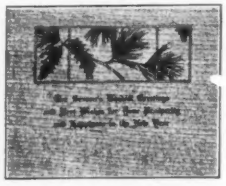

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Our grafted nut trees bear in one-third the time required for seedling trees. Why gamble on what a seedling tree will produce when grafted trees insure fine quality nuts? Send for our free descriptive catalogue today. NOW IS THE TIME TO PLANT.
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The Forest Post-Bag

So many letters of interest drop out of our mail bag each morning that the editors have decided to be generous with some of them. So—watch for the Forest Post Bag, learn what "they" think, and share our pleasure and profit. Comment on this column is invited.

In this, the worst fire year since 1910—the comment of Eleanora Van Evera, of San Diego, California—is impressive:

"We have been experiencing terrific forest fires in this country the past week. The heat from them thirty miles away was so intense the mercury registered 100 degrees at 7 o'clock in the evening, and all night and the next morning was the same, when it began raining for the day which brought relief to the situation."

And Theodore Marvin, Editor of *The Explosives Engineer* of Wilmington, Delaware, in an earnest desire to assist in the work of preserving the National Forests, writes:

"I was so impressed with the editorial on Colonel Greeley's article regarding forest fires, which appeared in a recent issue of AMERICAN FORESTS AND FOREST LIFE, that I have devoted the entire editorial page of the October issue of *The Explosives Engineer* to its reproduction."

A letter to the Editor under date of October 4th, from Joseph Joffe, Secretary to the Conference recently held at Yellowstone National Park, is so gratifying that it is reproduced in full:

"The National Park superintendents, in conference assembled at Yellowstone National Park from September 18th to 25th, inclusive, unanimously passed the following resolution:

"The superintendents and other National Park Service officers express to the Editor of AMERICAN FORESTS AND FOREST LIFE their appreciation of the excellent August number of that periodical with its fine presentation of the National Parks, their problems, and their personnel. And they trust that future numbers will continue to present similar material on the National Parks."

Now when the autumn woods are a blaze of color, and autumn scents are calling, a well-timed plea comes from Stanley Ranger, of New York City, in behalf of bittersweet —that graceful vine with the scarlet berries —so general a favorite for home decoration:

"A condition exists, largely caused by automobilists who want the berries for decorative purposes in their homes—which is proving destructive to the bittersweet. I believe at this time it would be a good plan to call attention to the situation, so that the people who go to the woods to gather these berries may be warned not to pull up the vines by the roots, but to use shears in cutting what they desire. This would really benefit the plants as well as prevent their destruction. But if this means is not taken, I am afraid that within a very few years this beautiful vine—as have many of our wild plants—will disappear."

Cull it, by all means, as Dr. Ricker suggests in this number, and bring the beauty and gavety of bittersweet into your homes, but use moderation in your culling so that this characterful wild plant may not be exterminated.

Fine appreciation of "Pardners"—the motion picture especially made for use in the Southern Educational Project of The American Forestry Association—has been expressed by Scout Executives of the South. Two letters we are printing here—the first from Scout Executive W. M. Marr, of the Greater Jacksonville Council of the Boy Scouts of America:

"Although it is rather late I want to take this opportunity to thank you for sending Mr. Moore to our camp with your forestry motion picture show. The program was very instructive as well as entertaining. The boys enjoyed it immensely. Please rest assured that our council stands ready at all times to cooperate with you in your work in behalf of conservation of our forests."

And the second from Scout Executive LeRoy Morris, of Hattiesburg, Mississippi:

"On behalf of the Pine Burr-Hattiesburg Area of Boy Scouts of America I wish to thank you for the picture which was shown at the recent camp of the Boy Scouts at Camp Major.

"This picture was educational and very much enjoyed by all present."

We are in receipt of a letter and large blue print from Richard J. Jacker of Cincinnati, showing a leaf from a Norway maple tree which measures 11½ inches across and

16½ inches from the tip to the stem. The leaf comes from a tree which stands on one of the streets in Cincinnati. It is 30 feet high and 10 inches in diameter 2 feet from the ground. Mr. Jacker challenges readers of AMERICAN FORESTS AND FOREST LIFE to find a larger leaf.

We hate to go searching for "carry-overs" too, and so the vote is unanimous on the comment of Mrs. Maud Wynne Cole, who writes from far away South Africa, at Sea View, near Durban:

"Please accept my congratulations upon the continued excellence of this splendid magazine and also upon its admirable format. It is a pleasure to read an American magazine that does not compel its readers to search for the latter half of each article in the back part of the paper."

Whitsitt New Hoo-Hoo Head

Gaines D. Whitsitt, of Amarillo, Texas, was elected Snark of the Universe at the thirty-eighth annual convention of the International Order of Hoo-Hoo at Amarillo, Texas, late in September. He succeeds Melvin M. Riner, of the Riner Lumber Company, Kansas City, Missouri. The convention was notable not only for the progressive nature of discussions, but for the large attendance of lumbermen from many sections of the United States and Canada. More than 400 attended.

Georgia Forest Fair

The second annual Georgia Forest Fair will be held at Valdosta, Georgia, November 21, 22 and 23. It is announced that a large number of exhibitors including government, state, forestry associations, lumber manufacturers associations and commercial concerns are arranging exhibits.

Particular stress will be placed on demonstrations. Forest areas nearby are to be employed for this purpose. Planting, thinning, turpentining, fire break construction and fire fighting are among the demonstrations to be conducted. Moving pictures, lantern slides and speaking will be on the program carried out in the exhibition building.

The fair is sponsored by the Georgia Forest Service and the Valdosta Chamber of Commerce.

Canada To Open New Park

A new National Park, located in the Mount Tremblant district of the Laurentian Mountains, Province of Quebec, will be opened by the Dominion Government in 1930, according to a statement by E. A. Carter, president of the Quebec Fish and Game Association. The park will include a tract of 1,200 square miles set aside several years ago by the province. Moose, deer, bear and beaver, as well as fish in abundance, are found in the area.

World's Tallest Flag Poles

The University of British Columbia has a new flag pole which, it is claimed, is the second tallest in the world. It is made from a single stick of British Columbia fir and measures 206 feet from the ground.

It was cut from the same forest from which was cut the great pole at Kew Gardens, London, England, which towers 214 feet in the air, and is said to be the tallest in the world.

Lentz Leaves Syracuse

G. H. Lentz, professor of forest extension at Syracuse University, New York, has been appointed silviculturist at the Southern Forest Experiment Station, where he will assist in the erosion and flood studies carried on jointly by the Forest Service and the Bureau of Chemistry and Soils.

National Museum Curator Dies

George Perkins Merrill, for the past thirty-two years head of the department of geology of the United States National Museum, died suddenly at Auburn, Maine, late in August. He was seventy-five years old, and was educated at University of Maine, Wesleyan University, and at Johns Hopkins University. He held gold medal awards of the National Academy of Sciences for research work in meteorites.

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Ask the Forester?

Each Month Forestry Questions Submitted to the Association Will Be Answered in This Column. If an Immediate Reply is Desired a Self-Addressed, Stamped Envelope Should Accompany Letter.

QUESTION: Where can I get Norway pine or Port Orford cedar shafts for making arrows, or yew or lemonwood or osage orange staves for making bows?—*E. B. S.*, Virginia.

ANSWER: Mr. E. F. McCarthy, Director of the Forest Experiment Station at Columbus, Ohio, says that the Norway pine used for shafts comes from the Scandinavian countries and is in reality slow grown Scotch pine. Its use for archery shafts was introduced in this country by such men as James Duff, who was formerly a bowyer in Scotland. Probably Port Orford cedar or some similar American wood would be desirable. This will require careful attention to detail by the manufacturer since archers are very critical. Some firm on the Pacific Coast might be willing to furnish squares if the matter were brought to its attention. The tropical woods are imported by a company in Brooklyn. The names of several firms were furnished and are available to others upon request.

QUESTION: I am interested in organizing a recreation and hunting club in Arizona and New Mexico adjacent to a National Forest. Can you tell me where information can be secured on this subject? Can you give me the names of some such clubs, especially in the West?—*C. E. B.*, Missouri.

ANSWER: There are comparatively few private clubs in the Southwest, but one very substantial development is at Vermejo Park on private land in the Maxwell Grant, west of Raton, New Mexico. A development is now being considered, known as the Frontier Club, on private and permitted land within the Apache National Forest, southwest of Springerville, Arizona, and a club in what is known as the "Gila Wilderness," on private land, has been considered. Some sixty miles north of Albuquerque, in the Jemez Range, is Rancho Rea, with developments running into hundreds of thousands of dollars. This combines the aspects of a private club and an exclusive resort. These are merely types of development. In addition, there are "dude ranches," inside and near National Forests, scattered throughout the two states. Such a place could be developed under permit on National Forest land, or a private ranch might be purchased near or on the Forest.

QUESTION: What are the most important aspects of the conservation problem in the United States today?—*C. J. B., Ohio.*

ANSWER: Your question is a big one and to answer it fully would require a column of space. But the three outstanding aspects of conservation which apply to forestry are the necessity for more adequate prevention of forest fires; a bigger and more comprehensive program of research and investigation on the growth of trees and the uses of wood; and, finally, more effective utilization of land for timber growth. These are all problems which The American Forestry Association is helping to solve. The finances for much of this will have to come from the Federal Government and from the governments of the several states. One of our objectives is to try to get Congress to appropriate larger sums for this work.

QUESTION: Will wearing of glasses stop anyone from taking the examination for forest ranger?—*E. G., New Jersey.*

ANSWER: If one's eyesight is satisfactorily corrected by the wearing of glasses, it will in no way interfere with the taking or passing of the examination for forest ranger. For further information concerning this examination, address the Civil Service Commission, Washington, D. C.

QUESTION: Are trees damaged by dumping earth from cellar excavations to spaces around trees?

ANSWER: There are so many examples available of trees that have died from this sort of misuse that it should be generally recognized that the tree practically smothers if any amount of dirt is piled around the base. It can be saved by walling the dirt back and keeping it at the original level around the tree roots.

QUESTION: What are the requirements of a radio operator in the U. S. Forest Service?—*C. F. B., Indiana.*

ANSWER: The United States Forest Service is not using radios in any of its official work. They are experimenting with the use of radio, but it will be some time before it gets out of the experimental stage.

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Book News and Reviews

FORESTRY IN SWEDEN. By George Sargent Perry. Illustrated. 276 pp. Published by the author, York, Pennsylvania, 1929. $2.50.

This book is the result of a year of study in Sweden and adjacent lands as a forestry fellow under the American-Scandinavian Foundation, and has for its background many years of outstanding achievement in teaching at the Pennsylvania State Forest School. One delightful characteristic of the work lies in the fact that the reader is not assailed by a mass of second-hand information.

Following a brief discussion of the history of Swedish forestry with reference to its legal aspects, Professor Perry embarks on a comprehensive investigation into forests versus agriculture, and forest influences in general. One striking observation which will not fail to occur to the American forester is the comparatively few tree species upon which the practice of forestry in Scandinavia is based. Three long chapters devoted to silvicultural activities are presented with a view toward adaptation to American conditions.

Sand-dune control and forest drainage are major activities in Sweden, and the chapters dealing with these problems will be of interest to foresters with engineering hobbies. Members of the Federal Forest Service will be interested to know that Sweden has a serious grazing problem, not always satisfactorily regulated.

Commercial or industrial forestry in Sweden is many years in advance of private forestry in America. Professor Perry's reasons for this condition, especially his opinions on tariff and finance, may not find general favor with forestry economists, but he shows unquestionably that "they manage these things better in Sweden."—H. E. C.

PETROLEUM AND COAL. THE KEYS TO THE FUTURE. By W. T. Thom, Jr., Ph. D. Princeton University Press, Princeton, New Jersey. 1929. Price, $2.50 net.

Petroleum and coal, the motive forces of the modern industrial world, are the keys to economic and military power and of these two substances petroleum is most likely to prove the apple of discord among nations in the near future.

In elaborating this major premise, Dr. Thom makes use of the great volume of highly technical material available on this vital subject. This material he has carefully distilled and arranged in a fashion that makes the book fairly easy reading.

The story of coal and petroleum is divided into three clearly defined parts. An introductory chapter compares and contrasts ancient and modern civilizations, pointing out the great influence mineral deposits have exerted upon national policies and imperial extensions since the earliest dawn of history. Succeeding chapters take up the origin, composition and classification of coal, the relative importance and various uses of the different species, and the location of the principal coal fields of the world. A discussion follows of the origin and geological occurrence of oil and gas, conjecture as to how oil is formed and a survey of the world's known petroleum resources. The concluding chapter discusses the question of the adequacy of the petroleum and coal reserves and their bearing upon the future.

Reserves available by the methods now in use are scant in comparison to coal, but they can be multiplied by economies of use, improvement in methods of discovery and production, and by a wise use of supplementary sources of energy such as gas and water power, the author contends.—A. C.

"Lessons in Forest Protection," by H. S. Smith, prepared by the Florida Forest Service, is included in the curriculum of the agricultural work of the high schools of Florida. The bulletin includes fourteen lessons in forestry, covering forest growth, forest products, forests and industry, and forest fires.

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GARDENING IN THE LOWER SOUTH. By H. Harold Hume. The Macmillan Company. New York. 1929. Price $5.00.

A handbook useful both to the amateur and professional gardener, Mr. Hume's new book treats comprehensively of garden-making in the exotic Southland, where flowers bloom and trees are green all the year around. There has been need for a volume such as this, with its generous illustrations and neatly arranged information, for literature on the subject has been scant and scattered, "militating," as the author says, "against the development of outstanding gardens in the lower South."

The area covered begins with the region surrounding Charleston, South Carolina, extends southward along the Atlantic Coast and westward around the Gulf of Mexico; it embraces the eastern parts of South Carolina, Georgia, all Florida, the southern regions of Alabama, Mississippi and Louisiana, and eastern Texas.

The book is concise, definite, comprehensive, and practical. Each chapter is clearly subdivided, facilitating use of the volume for handy reference. Opening chapters discuss general factors of climate and soils, landscaping, ways in which plants are propagated, cultivation, watering and fertilizing, and questions of when and how to plant. Special chapters deal with palms, azaleas, rose gardens, bamboo, water gardens, fruit and vegetable gardens and similar subjects. Lists of different trees and plants that will grow in the region are given at the ends of the different chapters.—A. C.

An interesting and well illustrated booklet has just been published by the Bessemer Galvanizing Works dealing with the structure of steel towers. It is enlightening to anyone interested in tower construction, as the process is pictured throughout.

"Seasoning, Handling, and Care of Lumber," a recent publication of the National Committee on Wood Utilization of the Department of Commerce, discusses practices which lumber manufacturers can adopt to reduce losses from poor seasoning methods. The report is based on facts obtained through an exchange of information on drying methods among leading lumber manufacturers. It is not an instruction manual, but rather a plain statement of the practices followed in the largest lumber-manufacturing plants. The value of the bulletin lies largely in the fact that it represents such a variety of practices, that the manufacturer can discard or adopt according to his own conditions.

An illuminating bulletin dealing with forest fires and forest fire-fighting methods has been published by the Aeroil Burner Company, New York.

"Strength of North American Woods Shown in Reference Tables"—Handy reference tables showing the strength of 129 different commercially important species of woods growing in the United States have been issued by the Forest Service, United States Department of Agriculture.

"Strength" as applied to wood may have a variety of meanings, depending on the use to which the wood is to be put, says the Forest Service. The mechanical properties include strength in bending, strength in compression parallel to grain and perpendicular to grain, stiffness, hardness, shock resisting ability, and shearing strength parallel to grain.

The mass of information about glues and gluing, which the Forest Service, United States Department of Agriculture, has gathered in the course of years of experimental work at the Forest Products Laboratory at Madison, Wisconsin, has been published as Department Bulletin No. 1500-D.

"Profit and Loss in Cutting Shortleaf and Loblolly Pine in Alabama," by W. W. Ashe. Bulletin 2, published by the Alabama Forestry Commission.

This is a guide to be used in determining in advance the probability of profit or loss in logging and milling pine timber in Alabama. The investigations were conducted in Alabama sawmills, and time and cost studies were made of various sized trees in the different stages of conversion from the standing timber to the finished product. The publication contains miscellaneous information concerning the volume and form of trees, grades of lumber cut from them and other related information of interest to the sawmiller and the forest land owner.

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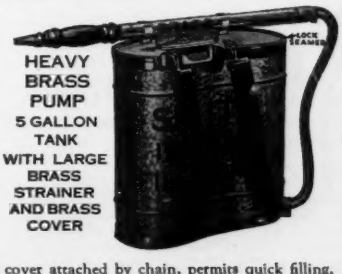

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Sawyer Goes to Illinois

L. E. Sawyer has been appointed Extension Forester in Illinois, to succeed C. J. Telford, who recently resigned to take charge of the small saw-mill studies of the Forest Products Laboratory at Madison, Wisconsin. Mr. Sawyer will make his headquarters at the College of Agriculture, in Urbana, and work through the county farm advisors in various parts of the State. During the past five years Mr. Sawyer has been assistant professor of forestry in charge of utilization at the Georgia State College of Agriculture. He was graduated from the Department of Forestry at Michigan State College in 1924.

California Studies Termite Control

A termite investigating committee established under the auspices of the University of California and financed by a number of lumber and coal companies, held conferences at Berkeley, California, September 1 to 14. The committee is studying the distribution of the thirteen species of termites in California with relation to their effects upon plants and buildings to determine principles of control. Experimental work now being conducted includes tests of poisons, wood preservatives and proper methods of building construction.

The committee is headed by Dr. C. A. Kofoid, Professor of Zoology at the University of California, and by Dr. S. F. Light. Advisory assistance has been given by Dr. Thomas E. Snyder of the Bureau of Entomology, United States Department of Agriculture, and Dr. Alfred Emerson of the University of Chicago.

Malay Plans Million-Acre Park

Efforts are being made to have a National Park of about 1,000,000 acres established in the Federated Malay States, according to information received by the National Park Service. Theodore R. Hubback, game warden at Pahang, in a letter soliciting information about National Parks in the United States, stated that the area under consideration is now a game preserve and contains a fair amount of game, which, however, is likely to be exterminated in the future unless further steps are taken to save it.

Frank Foster Fish Dies

Frank Foster Fish, secretary-treasurer of the National Hardwood Lumber Association, died September 30, following a brief illness. Mr. Fish had long been an outstanding influence in the hardwood affairs of the country, having served the Association for twenty-five years. He was born in Racine, Wisconsin.

Index to ADVERTISERS *NOVEMBER, 1929*

	Page
Aermotor Company	733
Aeroil Burner Company, Inc.	730
Aiken, George D.	726
American Red Cross	720
Bartlett Manufacturing Company	725
Bass & Company, G. H.	719
Beard Outdoor School, Inc., Dan	723
Bergmann Shoe Manufacturing Co., Theo	721
Bessemer Galvanizing Works, Inc.	730
Blue Ridge Park Nurseries, Inc.	729
Boyd Nursery Company	724
Bristol, H. R.	729
Bristol-Myers Company	726
Buechly, E. M.	729
Bulletin Guild	727
Colorado School of Forestry	736
Coolidge, P. T.	730
Davis, R. J.	719
Elm City Nursery Company, The	729
Fechheimer Bros. Company, The	733
F. & F. Nurseries	729
Fleu, Conyers B., Jr.	729
Franklin Forestry Company	729
Harvard Forest	736
Hauck Manufacturing Company	731
Hill Nursery Company, D.	725
Hirsch-Weis Manufacturing Company	721
Hough Company, R. B.	723
Hough Company, R. B.	726
Int'l. Combustion Tar & Chemical Corp.	733
Int'l. Harvester Co. of America, Inc.,	4th Cover
Irish Company, Chas. F.	722
Jones Nurseries, J. F.	726
Keene Forestry Associates	729
Kelsey Nursery Service	728
LaBars' Rhododendron Nursery	729
Lacey & Company, James D.	3rd Cov.
Lager & Hurrell	729
Landscape Engineers of America, Inc.	724
Lane, Thomas J.	729
Lilly Tree Surgeons, Inc., The	720
Living Tree Guild, The	725
Loganbrae Kennels	720
Long-Bell Lumber Company, The	724
Morris Nursery Company, The	729
Naperville Nurseries	729
tion	717
National Lumber Manufacturers Associa-	
N. Y. State College of Forestry, The	735
North-Eastern Forestry Company, The	729
Oregon School of Forestry	735
Piedmont Forestry Company	729
Purdy, Carl	727
Purity Bird Station	720
Rich, C. H.	730
Richards, E. C. M.	730
Riverview Kennels	720
Rockfall Nursery Company, The	729
Schumacher, F. W.	729
Smith & Co., Inc., D. B.	731
Smith-Gray	731
University of Idaho School of Forestry	735
University of Maine	736
University of Michigan	736
Utica-Duxbak Corporation	723
Van Yahres School of Tree Surgery	722
Verkade's Nurseries	729
Warwood Tool Company	730
Western Maine Forest Nursery	729
Wisconsin Aquatic Nurseries	720
Wohlert, A. E.	727
Woods Manufacturing Company, Ltd.	723
Yale School of Forestry	735

Reforestation in France

By Louis Hall

The first French reforestation laws were those of 1860 and 1864. These early laws, however, became the source of considerable friction between the state and individual landowners and in an effort to eliminate such difficulties the original laws were replaced by a new law on April 4, 1882. The new law recognized certain restorative and conservative forestry measures as being of public utility and classified them accordingly. The state, however, was only permitted to exercise its right of eminent domain in the case of lands obviously unsuitable for development in other ways, such as the banks of steep ravines and other precipitous or otherwise dangerous areas. The above limitations on the powers of the state were fortunately removed by a more recent law of August 16, 1913, recognizing as of public utility all reforestation programs deemed necessary for the proper protection of given areas against the ravages of inundation or the requirements of river flow and flood control.

The following brief summary of the results accomplished toward the reforestation of mountainous districts, from the origin of the *Administration des Eaux et Forêts* to the first of January, 1927, may be of interest. A total of 681,551 acres of land have been acquired by this Administration for the account of the state and set aside for reforestation purposes. Reforestation operations of one kind or another have now been extended over a considerable portion of this territory, a total of 444,602 acres having been either sown or planted. The acquisition of the above territory and the subsequent work of reforestation have involved a total expenditure of 122,546,816 francs, the state having paid 36,845,192 francs for the land itself while the balance of 85,701,624 francs was spent on actual reforestation.

In addition to the reforestation program executed directly by the state, local governments carried on similar programs over a combined area of 204,982 acres involving an expenditure of 17,163,903 francs. The state contributed to the extent of 9,192,767 francs, however, in the execution of these local programs. Similarly, the state's contribution in the form of plants and seeds supplied to individuals and planted over a total area of 220,697 acres amounted to 5,320,409 francs out of a total expenditure of 13,429,582 francs, the balance being the amount expended by the individual landowners thus assisted by the state.

As a further indication of the annual extent of the forestation work executed by the Rivers and Forest Administration, it may be pointed out that a total of 35,000,000 resinous tree plants and 3,000,000 non-resinous seedlings were planted during 1927. During the same year there were sown 61,740 pounds of resinous tree seeds and 2,205 pounds of non-resinous seeds. These figures include only plantings and sowings executed by the state, by local governments and by individuals receiving forestry subsidies from the Government. No statistics are available covering similar work carried on by individuals without recourse to governmental aid.

Of the total resinous plantings referred to above, 25,000,000 tree plants were grown in nurseries operated by the state, the balance of 10,000,000 having been purchased by the state from private nurseries because of the inability of the state nurseries to meet the total requirements. Pine tree plants of from two to three years old are produced in the state nurseries at a cost of from fifty to sixty francs per thousand.

Park Superintendents Hold Convention

National Park superintendents and other field officers of the National Park Service met in Yellowstone National Park, at Mammoth Hot Springs, September 18 to 24. The Washington Office of the Service was represented by Horace M. Albright, director, and Arno B. Cammerer, associate director.

The business sessions of the conference were devoted to road and trail problems, educational activities, landscape protection, fire control, patented land problems, and public contacts. Various points of tourist interest were visited in the park.

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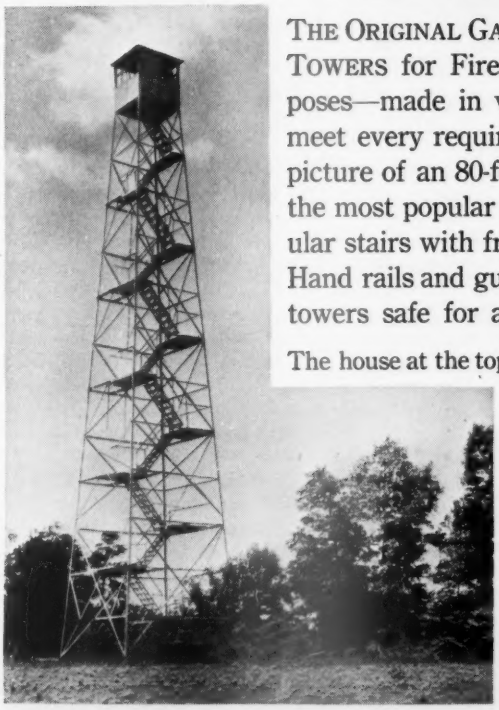

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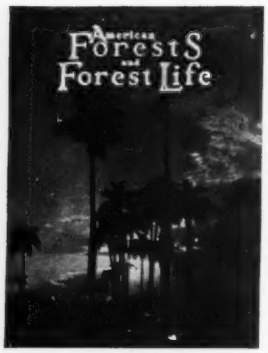

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Forest Meeting in Connecticut

The Fall field meeting of the Connecticut Forest and Park Association was held October 12 on the Maltby Division of the Eli Whitney Forests, near New Haven. This forest is part of the reservoir lands of the New Haven Water Company and was planted more than thirty years ago. Colonel Henry S. Graves, Dean of the Yale Forest School, and Professor Ralph Hawley, of the Yale School, were the chief speakers.

Leaves Have a Monetary Value

Tumbling autumn leaves have a commercial value because of the chemicals they contain and this value can be translated into dollars and cents, says the Pennsylvania Department of Forests and Waters. Studies conducted by the department show that one ton of oak leaves contains two and four-fifths pounds of phosphate, eighteeen and four-fifths pounds of nitrogen and seven pounds of potash.

The lightest of ground fires, sweeping an acre of oak forest, sends $4.00 up in smoke and gas, says the department, for the nitrogen is lost, though a large part of the potash remains on the ground. To this loss must be added the great value of the forest carpet as a retainer of moisture. Foresters point out that the fertilizer value of the leaves is arbitrary, that they do not possess as great a value in the forest as they would if transferred to agricultural land. However, experiments conducted in Europe show that wood growth is materially decreased with the removal of litter from a forest that is otherwise well-managed.

Appoint Gillett County Forester

Paul T. Gillett has been appointed county forester in Chautauqua County, New York, with headquarters at Jamestown, to succeed James E. Davis, who has been appointed assistant extension forester at Cornell University. Mr. Davis recently located and mapped 55,000 acres of idle lands whose average assessed annual valuation is $11.50.

Hope-Chest Forest

Tschekirge, a town near Broussa, Turkey, has a forest of hope-chests. The forest comprises a large tract of land on the outskirts of the town, belonging to the municipality, and each tree in it bears the name of a Turkish damsel. It has been the custom for centuries for every father to plant a tree when a daughter is born to him and to mark it with her name. When the baby grows up, the father cuts the tree, markets the wood and with the proceeds begins the filling of her hope-chest, without which she cannot win a husband.

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Elementary Forestry Schools in Finland

Finland has five elementary forestry schools, says the *Forest Worker*, to which students may be admitted on completion of the general elementary school course. Instruction is given in Finnish at four of these schools and in Swedish at the fifth. The course covers two years. Advanced education in forestry is offered by the university, which gives a course of theoretical and practical instruction that lasts three or four years and is followed by one year of practice. The university also offers graduate courses leading to higher degrees. A technical school of saw-milling at Viborg, privately maintained but in receipt of Government grants, trains foremen for the sawmills and other woodworking mills.

The forest research institute, established in 1917, employs three professors, with assistants, who engage in research in silviculture, forest mensuration and management, and forest soils. A second forest research organization is the Society of Forestry, founded in 1909.

Sebring Goes to Georgia

H. M. Sebring, formerly with the Florida Forest Service, has been named assistant state forester of Georgia to succeed Fred B. Merrill, recently appointed state forester of Mississippi. Mr. Sebring is a graduate of the Pennsylvania State College of Forestry, and was for a number of years connected with the United States Forest Service.

American Chestnut Over 60,000,000 Years Old

According to the evidence of the ages, the American chestnut tree grew in New Jersey more than 60,000,000 years ago. Recently a driller, sinking a well at Bradevelt, halfway between Freehold and Matawan, Monmouth County, noticed an unusually well-preserved piece of wood embedded along with pieces of carbonized wood, and turned it over to Meredith E. Johnson, state geologist, for examination.

Mr. Johnson identified it as belonging to the late Cretaceous age, a geologic period which ended over 60,000,000 years ago when many hardwood trees first made their appearance on earth. Unlike most fossil wood found in such formations, which is so decomposed that it is impossible to determine the species, this specimen showed both texture and fiber clearly. It was sent to Professor S. J. Record, of the Yale Forest School, for further identification and he pronounced it to be American chestnut. The rare fossil has been placed in the New Jersey State Museum.

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Alabama to Distribute Trees

The State Forest Nursery of Alabama has announced that it has more than 1,250,000 seedlings, from four to thirty inches high according to the species, available for planting this fall on vacant land. Seedlings up to 600 in number are being issued free to farmers who offer assurance that they will be properly planted and tended. Quantities above this number are sold at cost.

Approximately 790,000 of the little trees are black locust, 212,000 slash pine, 85,000 loblolly pine, 82,000 black walnut, 21,000 Japanese red pine, 16,000 long-leaf pine, 9,000 persimmon, 7,000 bald cypress, 7,000 water oak, 6,000 pitch pine, 5,000 Japanese black pine, and the rest miscellaneous species.

Oil Man On Wood Utilization Committee

W. H. Booth, purchasing agent of the Sun Oil Company, of Philadelphia, Pennsylvania, has been named to represent the American Petroleum Institute on the National Committee on Wood Utilization. Mr. Booth's appointment on the National Committee will enable the petroleum industry to keep in touch with recommendations in regard to good wood-using practices, the committee announced.

Britain Studies Cork Trade

An association of the cork trade has been formed in Great Britain as a result of the fact that during the last few years there has been a large increase in the world demand for cork for insulation purposes, which diverts this material from the manufacture of corks, lessens the supply and increases their price. The growers, it is stated, have found that they can sell their lower grades of cork for insulation purposes at prices showing a better return than if they were to utilize the material for the making of corks. The new association plans a survey of the trade.

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Among the Authors in This Issue

JOHN D. GUTHRIE is Assistant District Forester, in Charge of Public Relations, in the North Pacific District, U. S. Forest Service, Portland, Oregon; WALLACE HUTCHINSON is Assistant District Forester, in Charge of Public Relations, in the California District, U. S. Forest Service, San Francisco, California; and HOWARD R. FLINT is in Charge of the Fire Control Works, U. S. Forest Service, Missoula, Montana.

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ERNEST C. OBERHOLTZER is President of the Quetico-Superior Council of the Izaak Walton League of America.

Robert P. Bass

ROBERT P. BASS, former Governor of New Hampshire, is one of the great forest conservation personalities of the country. He was formerly President of The American Forestry Association and has made many important contributions to its work.

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HISTORY — The property is rich in historic interest. The May River was discovered in 1562 by Jean Ribault and the section was populated as early as the 17th century. By the second quarter of the 19th century this territory was well settled and prosperous, followed by decline after the Civil War. Early in the 20th century northern people became interested in the establishment of game preserves and winter homes in this region. This property was the home of Mrs. Cornelius Vanderbilt and has been maintained as an estate for many years, with special protection and care of game.

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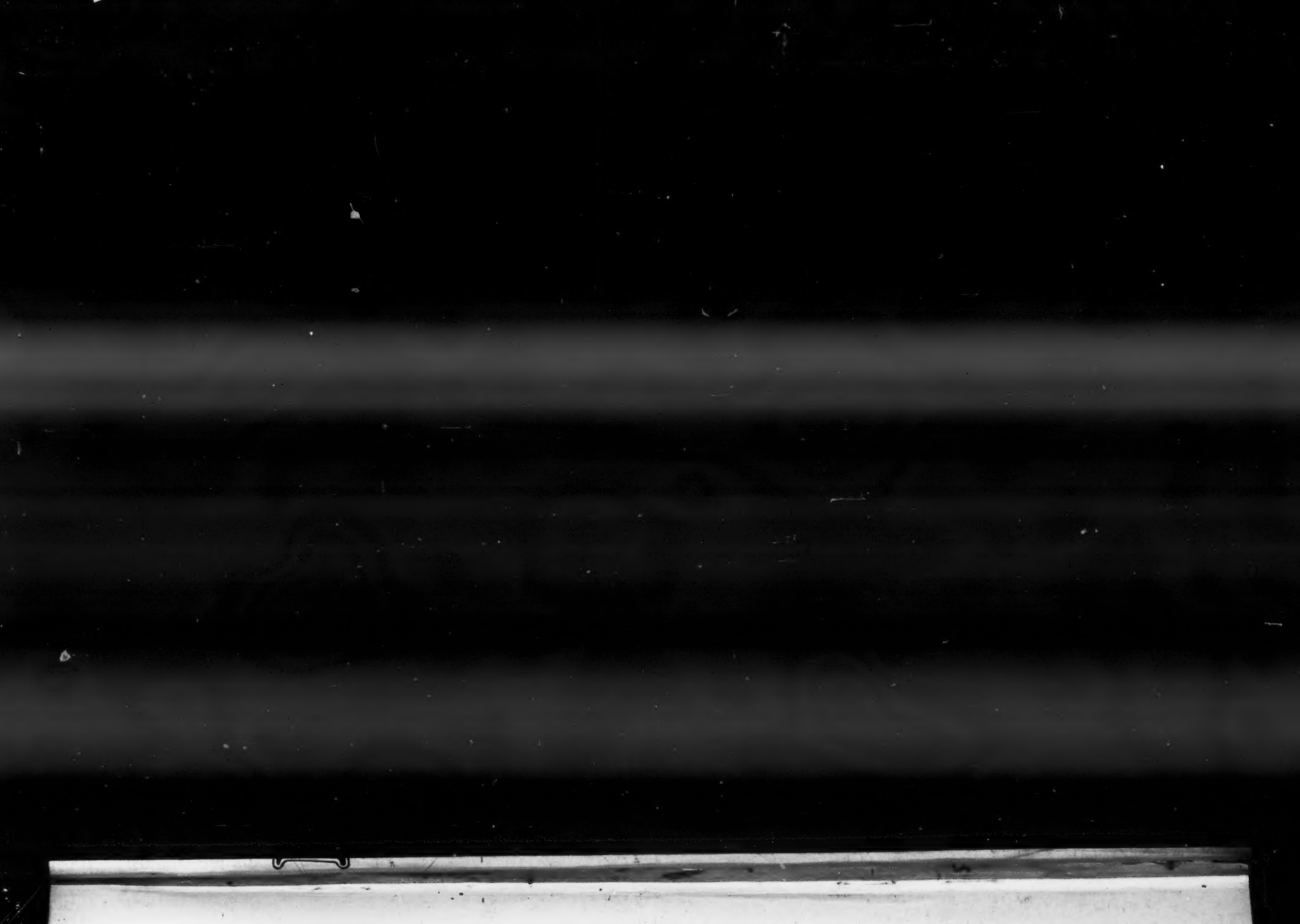
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